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[*The figures refer to the number of the Journal, and not to the page.*]

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BOSTON, JANUARY 4, 1879.

CONTENTS.

The New York legislature will meet after the holidays in their new capitol, a building which has been the centre of many battles, both artistic and financial, for the last three years. Our readers will doubtless remember the struggle which followed the effort of the Advisory Board to change the style of the building, of which we gave a pretty full account at the time (see *American Architect* for 1876, *passim*), the battle of styles among architects, and the final order of the legislature that the exterior of the building should be finished in Renaissance. The violent opposition of the New York architects, intemperate as it was, undoubtedly did good in the end by preventing an abrupt and conspicuous transition at mid-height from a rigid Renaissance treatment to an easy-going Romanesque; and pains has been taken in what has thus far been added to the exterior to secure a degree of harmony between the lower part and the freer Renaissance work which has been built upon it. No restriction, however, was set on the style of the interior, and the architects of the Board have been indulged in a Gothic Assembly Chamber, as well as, we believe, a Romanesque treatment of the interior court. We published three weeks ago a correspondent's interesting description of the building as it is, particularly of the new Assembly Chamber, which is at present its most interesting feature. Mr. Hunt's work has meanwhile been finished, and by the seventh of January (the day appointed for the formal opening of the building) that part of it which is meant for immediate use will be in order. This is only the north wing, perhaps a third of the building, and for the present the State Senate will be housed in the room beneath the Assembly Chamber, which was originally intended for the Court of Appeals, the Senate Chamber proper being in the south wing, which is still unfinished. The New York daily papers, apparently confused by the traditions of the old quarrel, have treated their readers to some amusing comments upon the discordance between the Romanesque lower stories of the exterior and the Renaissance of the upper part.

Mr. W. W. Story, who has before shown his interest in the Washington Monument by various suggestions for its amelioration, has lately written a long letter about it to Mr. Corcoran, which is published in the *Washington Post.* He refers to the design which he lately offered through Senator Morrill, and makes a spirited protest against the carrying out of the present intention. Mr. Story's design, as it is described, is simply the carrying out of one of his suggestions made a year ago. He proposes, in brief, to use the existing stump as the shaft of a tower, to which he will add a porch at the base, with an equestrian statue of Washington beneath it. This at one side of the base would be balanced by a statue of Liberty on the opposite side, and on the lateral faces are to be two bronze doors sculptured with the scenes of the Revolution. At the top is to be a statue of Fame in gilt bronze; whether above the conical roof which Mr. Story proposed before or not, we do not learn. He recites the obvious objections to the present design, very much as we have heretofore presented them. To the argument that the Association is pledged to carry out the original, he answers pertinently that the most distinctive features of that design have already been given up, — the combination of the circular colonnade with the obelisk. Of the obelisk itself he pungently says: "This form of monument is the refuge of incompetency in architecture. When an architect has no ideas he resorts to the obelisk." The Monument Commission has decided, it is said, to lay Mr. Story's design before Congress, without any recommendation, assuming that it has no power to to adopt a plan; but is opposed to any change in the present design.

The people of Cleveland are rejoicing over the completion of their great viaduct, which was dedicated and opened for travel with much solemnity a week ago. Their handsome city, standing on a bluff bank some eighty feet above Lake Erie, is divided by the small river Cuyahoga, which there runs into the lake. The new viaduct crosses the river and the margins of lower ground on each side of it, binding together the high lands on which the two parts of the city are built. It is a grand and costly structure, more than three thousand feet long; a solid causeway at the ends, continued on broad stone arches across the low ground, and across the river on iron trussed girders, dipping somewhat toward the middle, with a pivoted draw-span of 332 feet, where the roadway is seventy feet above the river. The trusses are what are called double intersection Pratt trusses, and are computed for a live load of one hundred pounds to the square foot. The whole width of the viaduct is sixty-four feet, of which forty-two are given to the roadway, which carries two horse-car tracks, and eleven to each sidewalk, with its parapet: but it is narrowed to forty-six feet at the draw. The structure has consumed, the engineer reports, some fourteen hundred tons of iron (the draw weighing more than five hundred tons), eighty thousand perches of stone, fifty miles of piles, and has cost nearly two millions and a quarter. There are about seven hundred and fifty feet of causeway, thirteen hundred and eighty of viaduct, and nine hundred and thirty-two of iron bridge.

The bridge has a history, and its completion is of special significance to the people of Cleveland as marking the final issue of a long struggle. The settlements on the two sides of the river have not always been one community, nor even fraternal in their relation. Till within a little more than twenty years they were two towns; the larger, on the east side, being called Cleveland, and that on the west the City of Ohio, or more popularly, Ohio City. The two cities showed from their infancy a propensity to quarrel about crossing the river, and when after two or three rude floating bridges had been swept into the lake by freshets, a permanent bridge was first built in 1836 by some citizens of Cleveland, where the Columbus Street bridge now is, a bitter family quarrel began. The people of Ohio City wanted the bridge at another point, and had got it nearly finished when the partisans of the Columbus Street bridge put an injunction upon it, stopped it, and ruined its contractor. Then the people of Ohio City declared the Columbus Street bridge a nuisance, and their sheriff removed the draw in the night. The draw being presently replaced by the people of Cleveland, their neighbors tried to blow up the bridge. Their explosives failed, and the City of Ohio cut a trench along their shore and isolated the bridge from the bank. When the Clevelanders attempted to fill up the trench they were arrested, but it proved impossible to hold them, and being set free, they established a guard to protect the bridge. Thereupon the people of Ohio City assembled in the basement of one of their churches, appointed a commander, and after fortifying themselves by a religious service marched upon the bridge, armed with whatever mischievous tools they could lay hands on. The Clevelanders meanwhile had planted a field-piece to sweep the bridge, loading it with spikes and old iron. Fortunately a clever Yankee on the Ohio side contrived to spike the gun, but a battle followed which was only prevented from being bloody by the scarcity of fire-arms. It was interrupted by the sheriff of the county, and to this day the descendants of both sides claim the victory. The result was that in the end both bridges were retained. The project of a high viaduct was first suggested, in 1836, by an enterprising editor of the Cleveland *Advertiser*, who proposed to build one on a great scale, that should serve for railway communication as well as for ordinary travel. His scheme was derided as wild, and it was not till after the war that a similar one was seriously pressed. But it was a chief point in the agreement under which

the two cities were united that the consolidated government should give its special attention to providing the river with adequate bridges as they should be needed. In 1870 the Mayor of Cleveland, Mr. Buhrer, in his annual message urged on the city the importance of a high-level bridge. The matter was then taken up in earnest, though it was delayed by litigation, legislation, and divided counsels, and only in 1874 was the actual viaduct, for which the first design had been furnished by Mr. Strong, the city engineer in 1872, begun under the charge of Mr. B. F. Morse, then city engineer, who has carried it through to the end.

The Student's Art Club, of Harvard College, has opened what is a very interesting exhibition, and in some ways unique. It consists of drawings made and collected by Mr. Moore, the instructor in Art of the University. Among them are a number of drawings by Mr. Ruskin, several of Ward's remarkable copies of Turner's water-colors, a good many of Mr. Moore's own drawings, made mostly during a late visit to Europe, and copies by him of pictures or parts of pictures by some of the Venetian painters, and by Botticelli. The main purpose of the collection is to show the students in the Fine Arts course the value of careful and conscientious delineation, and to give them examples of this for study. It would be a good thing if some of Mr. Ruskin's superb drawings could be seen by the many persons who, having looked at one side of him, will see no other, and think of him only as the prophet of laborious manipulation. Mr. Moore's drawings also are masterly in their kind, some of them rapid and some of them finished with the last degree of care. The examination of one or two of the drawings of both, ought to give the student a comforting sense of the sureness and force in rapid work which are given by the habit of deliberate and painstaking study, as the pianist gains the utmost mastery for execution by deliberation in practice. The whole exhibition, not a large one, makes a valuable showing of one side of the painter's work, and that aside that it is much the fashion to neglect nowadays.

Mr. Charles Augustus Howell is a gentleman of taste and culture, a collector of prints and *objets d'art* of all sorts, and a decorator of houses. A few years ago he leased a fine old Queen Anne mansion in the neighborhood of London, and fitted it up luxuriously with all the appliances which modern taste has revived or discovered, with a view to the more attractive setting forth of the pictures, bronzes, pottery, tiles, and other details of household art which formed his stock in trade. To this artistic paradise his friends were tempted, and there, betrayed by the splendor of the surroundings, were at once converted into clients, to the great advantage of the higher civilization, and to the great profit of the ingenious Mr. Howell. By the requirements of his lease, he was obliged in the outset to lay out £500 in repairs, and to pay £170 per year for twenty-one years. Being dispossessed by the Metropolitan Railway some sixteen years before the termination of the lease, he brought suit against it to recover for interest in the lease, for money laid out in decorations and repairs, for value of fixtures, cost of removing, and interruption of business. He claimed that he had laid out £1,000 in substantial repairs, and £1,000 in permanent embellishments, and had thus, and by his furniture and fittings, created a type of fashionable decoration, which had inflamed his wealthy patrons with a sort of *artis sacra fames*. The evidence produced was mainly given by the leading decorators in London, by Mr. Godwin, the architect, and by the claimant himself, who succeeded in making a very effective presentation of his case, and in delivering his testimony with such humor and *bonhommie* as frequently to interrupt the proceedings with "roars of laughter." The evidence mainly went to show that, according to prevailing tastes, an old Queen Anne mansion is better adapted for the exposition of objects of household art than any other, and for this reason, and because genuine Queen Anne mansions are not conveniently in the market for such purposes, the claimant was entitled to special damages for the loss of an important appliance of business. As for the amount of these damages, the estimates of the various witnesses did not greatly differ, and in detail they serve as a curious exponent of the pecuniary value set upon sentiment. The following items pretty fairly represent the average figures: For interest in the lease, £1,400; for cost of replacing the decorations, £1,000; for repairs over and above those required in the lease, £500; for cost of removal and loss of business, £750. The jury, after a very brief deliberation, gave a verdict accordingly for the very handsome sum of £3,650.

There does not seem to be much expectation that Congress will accept any benefit, at present at least, from the report of the Committee on National Surveys, which we printed in our last number. Its proposal is one in which people do not generally take the interest it deserves, and we have seen it opposed on grounds which indicated that the real bearings of the plan were not understood. The objection has been made, and we fancy it will be commonly raised, as it certainly will be influential among persons who do not think much about the question, that the project suggested by the Committee is enormously expensive. We have seen a computation that to carry out such a system of geodetic and topographical surveys as logically follows from the report would cost a hundred and fifty millions of dollars. Without troubling ourselves about the actual sum called for, we may feel satisfied on two points: First, the amount of work provided for by the scheme has got to be done in the end, and will be done by some means or other; and it will be done at greater cost and with less accuracy if it is left to be done as it may, than if it is carried on under a single efficient management. Second, there is no more need under the proposed system than under any other, or than under no system, of doing all the work at once, or of doing it any faster than it is required.

The details of the assignment of the work which the committee proposes involve questions of administration upon which we do not assume to pass; but it is certain that both the quality of the work and its economy would be favored by combining all the surveys of mensuration that are carried on by the government into one coherent system and under one administration. The necessity for a consistent and continuously executed scheme of mensuration, extended over its territory and carried out as it can be only by a government, has been recognized in all civilized countries except our own. Some of our older States are tardily and expensively, but necessarily, supplying their want of such a system by State surveys, and the evils of the contrary plan are strikingly brought out by the progress of the New York Survey. Local surveys are found not to consist with each other or with themselves; the maps compiled from them are misleading; towns are laid down miles out of their proper places; boundaries are in dispute, and property sometimes taxed in two counties at once; contouring and levelling are not, and every new engineering enterprise requires a new determination of the old data. As our country fills up it must be surveyed in detail, piece by piece, and the question is simply whether this shall be done in a consistent, accurate, systematic manner, and properly recorded, with the precision and economy which are only attained by doing such work on a large scale, and by uniform method; or whether it shall be fragmentary, disorderly, incomplete, and untrustworthy, its results unrecorded, so that it shall have to be done again and again, here and there, with the vexation and waste that attend the incoherent execution of work which demands system.

ARCHITECTS' COMPETITIONS.

II. TRIAL BY ARCHITECTS.

In our last article on competitions we dwelt on the faults of open competitions, or those which, ignoring the architect, are decided only by a comparison of drawings. We argued that, whatever their advantages, they are extravagantly expensive to architects; more or less derogatory to the profession, inasmuch as they put the architect out of sight behind the draughtsman, and give committees a low idea of the value of his service; misleading to committees and clients by inducing them to put undue faith in their own judgment and select their architects in the dark; embarrassing to both sides by hemming them in with restrictions, which it is dishonorable to violate, and often awkward or even injurious to abide by; and productive of much ill blood and unfair dealing. We argued also that the results of such competitions were liable to be unsatisfactory, because they were designs struck out at a heat, worked up with much labor, but without mature consideration, and under temptation to aim at immediate effect rather than at well-considered excellence. We said that there was another view of competitions and their purposes which naturally led to a different management of them, and, in our opinion, to better results. In this view the purpose

of a competition is to select not a design but an architect, and of this we have next to speak.

It is a natural thought that the ultimate purpose of any client is to procure a "plan," — using the word in the loose generic sense which it is common to give it, — and that therefore this may properly be the foremost thing from the beginning. But this is not really the case. The ultimate object is actually neither a plan nor an architect, but a building of some kind. The architect's drawings are merely his description of what he proposes that the building shall be, — a description necessarily more or less imperfect and incomplete, usually hasty, and often quite far from what he would in the end offer. The actual comparison by which selection is made is not even between the plans themselves as they are submitted, but between what the client, or the building committee, which for brevity's sake we will call the client, may discover in them; for the ordinary client or committee never sees all, or nearly all, that is expressed or implied in the drawings before him. But there is a great deal more in the execution of a building than can be shown in any description of it, however minute. The details of its carrying out, the architect's capacity to realize his intentions, his faithfulness and success in management, the skill with which he may meet emergencies, or adapt himself to alterations, that are not foreseen, — all these are important factors in the result, and may, in the end, prove more important than the plan he submits at the outset. Since, then, plans are by no means all that is wanted, and since the client cannot see all that they are, it is worth while to encourage among clients the understanding that the architect is more than his plans; and, in the interest of both, any system which, by giving predominance to the plan, tends to depreciate the personal quality of the architect is so far to be deprecated. That this is the tendency of what we have called trials by plan will hardly be disputed by anybody who has carefully watched their working. We need no better instance than the recent competitions for the Indiana Capitol.

The obvious way to make sure of the personal qualities which are as important in an architect as in any other professional man, and are but dimly indicated in his plans, is to consider beforehand who shall be employed, as is done in the other professions, and to choose one's architect according to his known qualifications. This principle of selection would seem to supersede competitions, as was substantially proposed by President Barry in the address to which we have before alluded; and if it should be applied so as considerably to diminish their frequency there would probably be no harm done. But different architects, though they be of presumably equal skill, not having a definite result to reach, like the curing of a patient or the winning of a lawsuit, are sure to solve the same problem in different ways, among which ways the client is likely to have a decided preference. Nor does it necessarily happen that the most skillful architect will in any given case be the one who among the innumerable possible solutions will hit upon the happiest; still less that he will find that which will be most acceptable to the client. Hence for buildings of especial importance competitions in which architects present their designs are popular, and doubtless always will be; so that it is of more avail to study how they shall be turned to best account than to protest against them.

The serious difficulties which we have described are most easily avoided and the real ends of competition secured by limited competitions, in which the client invites a number of architects to take part who are all known to be persons to whom he would intrust his work with confidence that it would be satisfactorily done. The qualifications of the architect being assured in advance, the client, who knows that whichever design he selects will be carried out with skill and faithfulness, and that its author is capable at need of adapting or modifying it to suit his requirements, is concerned only to know which will submit the general scheme best suited to his wishes, while the architects are concerned only that personal preference shall not influence his judgment of their designs, and that one of themselves shall not have an undue advantage over another. Personal preference may be ruled out by an anonymous competition, which does not in this case put the trustworthy and the untrustworthy practitioner on a level. There being no need to guard against an unsatisfactory carrying out of the designs submitted, slight sketches are sufficient, provided only that their leading ideas be carefully considered, to show the client all he need know of the character of the designs, and probably all that he is really capable of judging. A general description may take the place of a specification. A rigid scheme of requirements is not necessary, but only such ideas as the client thinks it well to suggest, holding himself ready to waive them in favor of anything which the competitors may propose; nor is a rigid limit of cost, it only being important to suggest the limit which the client prefers not to pass, the designs being accompanied by reasonably approximate estimates, which will be factors in their comparative advantages, and the competitors being at liberty, as they should be, to consider how far the character of their designs justifies their cost, and to submit what in their judgment is the best thing for the circumstances.

By such a procedure the extreme and wasteful cost of competitions may be very greatly diminished, and with it the annoyance, excitement, and interruption of business to architects, the difficulties of clients in choosing, and the danger of their blundering; while the likelihood of a good ultimate result is greatly increased. The comparative simplicity of the drawings which are required makes it easy to spare architects the temptation to a seductive display, and ought to secure the client against being diverted from the main object of his selection. This main object secured, the fewer restrictions there are to hamper both parties the less will be the waste of time and labor, the less the danger of misunderstanding and subsequent recrimination or the bitterness of disappointment, and the probability of a hasty committal to a scheme which is not the best. The competition ceases to be a trial by plans the qualities of whose authors are unknown, and becomes a comparison of projects between advisers in whom the client has confidence, and in any of whose hands he feels himself safe.

Perhaps the greatest recommendation of such a system of competition to architects is not its economy nor its security, but the fact that it tends to substitute a relation of proper professional confidence for one of distrust. The client does not attempt to strain his judgment to cover a multitude of particulars which are properly professional, but confines himself, until he is in consultation with his architect, to the general considerations which lie most within his range. He assumes from the beginning that the ultimate form and detail of his project are matter for professional consultation, and therefore, limiting his counsellors to trusted architects, assumes at once an attitude of confidence toward them, instead of demanding securities in advance for the competence of the unknown architect whom he may select, or inviting disappointment if he proves incapable. The relation of architect and client is instinctively different in the two cases. On the one hand there are profuse offers of service and the feeling of the client that he has seen to the end of the architect's work; on the other, the necessary comparison of preliminary ideas, and then the client knowingly commits his important charge to the discretion of a trusted agent. In the one case there is from the outset a presumption of confidence, in the other of distrust. The successful competitor may in the former case conquer the presumption against him by his personal dealing, but there can be no doubt that the difference in the two cases makes a real difference in the respect which the clients have for the profession at large; this is the important thing, and it is an advantage not to be overlooked. There are the compensations which we have quoted, that general competitions tend to lessen the overweening influence of names, and give a chance for unknown men to come forward. These have their weight, and must be kept for further consideration, but it must not be forgotten that one of the great stumbling-blocks in the way of our profession is the tendency to mutual distrust between its clients and itself. Any system that encourages an attitude of mutual defiance instead of a confidential one is to be carefully scrutinized. The conditions of business life furnish no substitute for confidence in a professional adviser.

DECORATIVE ART.

In our superficial age there seems to be some danger that the term "Decorative Art" will come to be limited to the sunflowers in crewels and the vegetable forms on pottery that have sought its protection. But decorative art, as the term implies, is art subordinated or controlled to a decorative purpose, and in this wider sense all art should be decorative, except such manifestions of it as have to do only with the rendering of facts.

Much has been written as to flatness in decorative art, and many have held that it was one of the prime and essential conditions of all decorative work in color: it seems to us that much of the misdirected effort, and its meagre or even hideous results, is due to mistaking for flatness, in good work, what is really continuity of sur-

face. Flatness, as it is exemplified by modern theorists, is really no better in painting than it would be in music or in cooking; the very term "flat" should be a sufficient warning, for it seems born to be associated with stale and unprofitable. Flatness of color, and dryness and endless repetition of hard outlines are nearest akin to vacancy.

A hinting at relief, and play of light and shade, delicate gradations of tone, sometimes melting into one another, sometimes vigorously opposed; a composition of form and color arranged and controlled by the designer, and repetitions and geometric arrangements, when not too evident or too monotonous; such seem to us the true qualities of decorative work so long as the ornament grows out of the essential or constructive qualities of that to which it is applied. Such decorations are likely to please the imagination and to occupy and instruct it without forcing themselves upon the attention. All ornament ceases to be decorative, no matter what inherent beauties it may possess, the moment it contradicts the qualities of the object to which it is applied or attempts to make that object seem what it is not. A painter may suggest distance, foreshortening, or light and shade, and his painting will be decorative, so long as it is in proper harmony with its surroundings, if it does not attempt to simulate the above qualities of nature. An attempt to simulate or imitate the facts of nature destroys necessarily the continuity of the painted surface.

All art up to the beginning of the sixteenth century was decorative art, and even up to the present day many of the greatest efforts of art have been truly decorative. But with the growing skill of the artists in mastering the technical difficulties of their craft, the tendency developed of making paintings and sculptures with less and less regard to the relations they were to bear to objects around them and to balanced distribution of color, until now, the commonly accepted idea of a painting or piece of sculpture is an object bearing no relation whatever, either in sentiment, color, or form, to any of its surroundings, and in the case of paintings separated from its surroundings by the strongest imaginable barrier, — a heavy mass of gilded frame.

The artists and the public together have gradually wrought this change, and architecture, sculpture, and painting, instead of working hand in hand, as they once did, in the realization of ideas that glorified them, all have come to live separate existences, seriously to the detriment of them all.

The great arts named above have found other, though narrower, fields in which to live and work; but how many of the minor expressions of art have gone entirely astray or disappeared. Mosaics, enamelling, jewelry, bronze-casting, and wood-carving make but a poor showing when compared with the work of the past.

That easel painting, as we may call the modern developments of the painter's art, has proved itself noble, worthy, and true art, and sometimes decorative art as well, is, of course, unquestioned; but that the arts, in general, have suffered by the absorption of so much of the artistic effort of our time, into one relatively narrow channel, seems equally certain.

The French, who take the lead in our day in art training and in organized development of the fine arts, have long recognized this fact, and have constantly encouraged in their public buildings the coöperation of the painters and sculptors with the architects. They have achieved varying results, of course, but also enough brilliant successes to prove the value of the attempt. The names of the painters, Delaroche, Flandrin, and Baudry; and of the sculptors Pradier, Chapuy, and Bartholdi will go down to posterity in connection with the great monuments they aided in making beautiful.

By taking almost at random a few examples of old work, it will be seen how interdependent the parts of a great design were made and how their interdependence enured, not only to the beauty of the general effect, but to the beauty of each separate part.

In Greek work the harmony of combined effort was greatest, and though we know but little of their use of color, the power they have shown in developing the relations between their architecture and their sculpture, and their unerring perception of the limits and possibilities of each, should satisfy us that they could not have gone far wrong in color. The way in which the sculpture of the Parthenon is composed to give the greatest and most noble effect, the way its great richness of relief and wonderful modelling is controlled to enhance the purely architectural lines, and on the other hand the feeling that inspired the architect, and enabled him to make the dignity and almost severe simplicity of his forms not only harmonize with but enhance the graceful, flowing lines of sculpture, all deserved the closest study, and most enthusiastic homage.

The same harmony is seen in the Egyptian temples and monuments, where the architecture, sculpture, and painting are all moved by one common and controlling thought. In India, on the other hand, wonderful monuments exist which might be great but for the encroachment of the sculptor on the architect's domain.

In Italy, beginning with the earliest Byzantine period, and following the development of the Italian Arts, we have in Cimabue, Giotto, Fra Angelico, Donatello, and on to Raphael, Titian, and a host of others, artists whose works were in the widest sense decorative. They all had this in common that they recognized the need of subordinating their work to the general scheme, and to the controlling conditions of light and space and surroundings. Their works were composed so entirely with a view to their decorative effect that a patchwork of the color could be taken (the experiment has been successfully made), say in a fresco of Signorelli's, and a purely conventional treatment of natural forms could be worked over that patchwork, and the result would still be decorative and beautiful in a high degree, though losing, of course, the charm of human sentiment and the powerful appeal to the imagination of the emotions depicted in the fresco.

It has always seemed to us that the Sistine marked a turning point in the history of art. It is the first notable instance in which the painter, in his magnificent strength, chose to disregard the constructional forms imposed upon him, and to simulate an architectural structure of his own in paint, and we have always felt, that, in spite of its great qualities, it fails of being the best work in the measure that the painter succeeded in his attempt; certainly the Sistine opened the way for the dreadful abuses of the later schools, which piled one fantastic structure upon another till there seemed to be miles of distorted perspective on their ceilings, and brought the clouds of their heavens down in plaster reliefs upon their cornices and architecture.

When the painters first lost sight of their true relation to the whole composition, and began to sacrifice the effect of the whole to the glory of their technical skill, they found the public ready to encourage them with applause and patronage; both the artist and the patron losing sight of the greater in their admiration of the wonderful and more novel qualities of the narrower field of art, until, to-day, the easel painting reigns the accepted and almost the only field for the painter's genius.

This is not meant to detract from the value, nor to deny the high achievements of the easel-painters, but to point out to the public, and particularly to those of the public who control great buildings, museums, or churches, or who are making homes that they expect to stand as a worthy remembrance of themselves in the eyes of their posterity, that there is a great and glorious field of art which is almost unproductive. The painters feel this, and there are many men of mark amongst them who would bring to the task of laboring in such a field a fresh enthusiasm and inspiration that would be sure to produce good work, and when experience had once cleared the way of technical difficulties splendid results might follow. The architects and sculptors would hail the coöperation as sure of giving a crowning glory and an added importance to their own work. But it is for the public to take the initiative, and if any one should doubt the practicability of these suggestions, let him visit Trinity Church, in Boston, where Messrs. Gambrill and Richardson had the coöperation of LaFarge; or St. Thomas', in New York, where LaFarge and St. Gaudens, the sculptor, worked together, and, in spite of architectural dispositions on the whole unfavorable, achieved an excellent result. It seems unlikely that any one will dispute the advance in tendency that these works, and some few others that have been done in this country, show over the work that has preceded them; they are of necessity experimental in many ways, and better results could have been obtained but for the difficulties which had to be overcome, such as the want of experience in matters of technical treatment, and in the want of skilled workmen to carry out certain parts of the work done as preparation for the color.

How much yet remains to be done before the public in this country is made familiar with the idea that architects, sculptors, and painters should coöperate in the carrying out of public or private buildings is shown by a glance at any of the more important of them.

The only attempts on the part of the public at obtaining decorative work, have resulted in throwing a great deal of such work into the hands of the architects who have struggled valiantly to do things for which they are only qualified in as much as they appreciate the possibilities of the case, and are loath to have it entrusted to hands less competent than their own. No architect is competent to design and carry out the decoration in color, or the modelling of the sculpture in the work he designs, unless he either limits greatly the possibilities of the decoration or else gives a great deal more time to the mastering of technical knowledge than usually he can afford; but at least the architect, as the result of his broader training and wider studies, can do what he does in decoration with a much greater harmony of general result, than the decorator, cabinet maker, or upholsterer of the same relative standing, who have much greater technical resources. This is natural, and as it should be, and if only the painter and sculptor were called forward when the occasion required their work, every one would benefit by limiting himself to that for which he was best fitted.

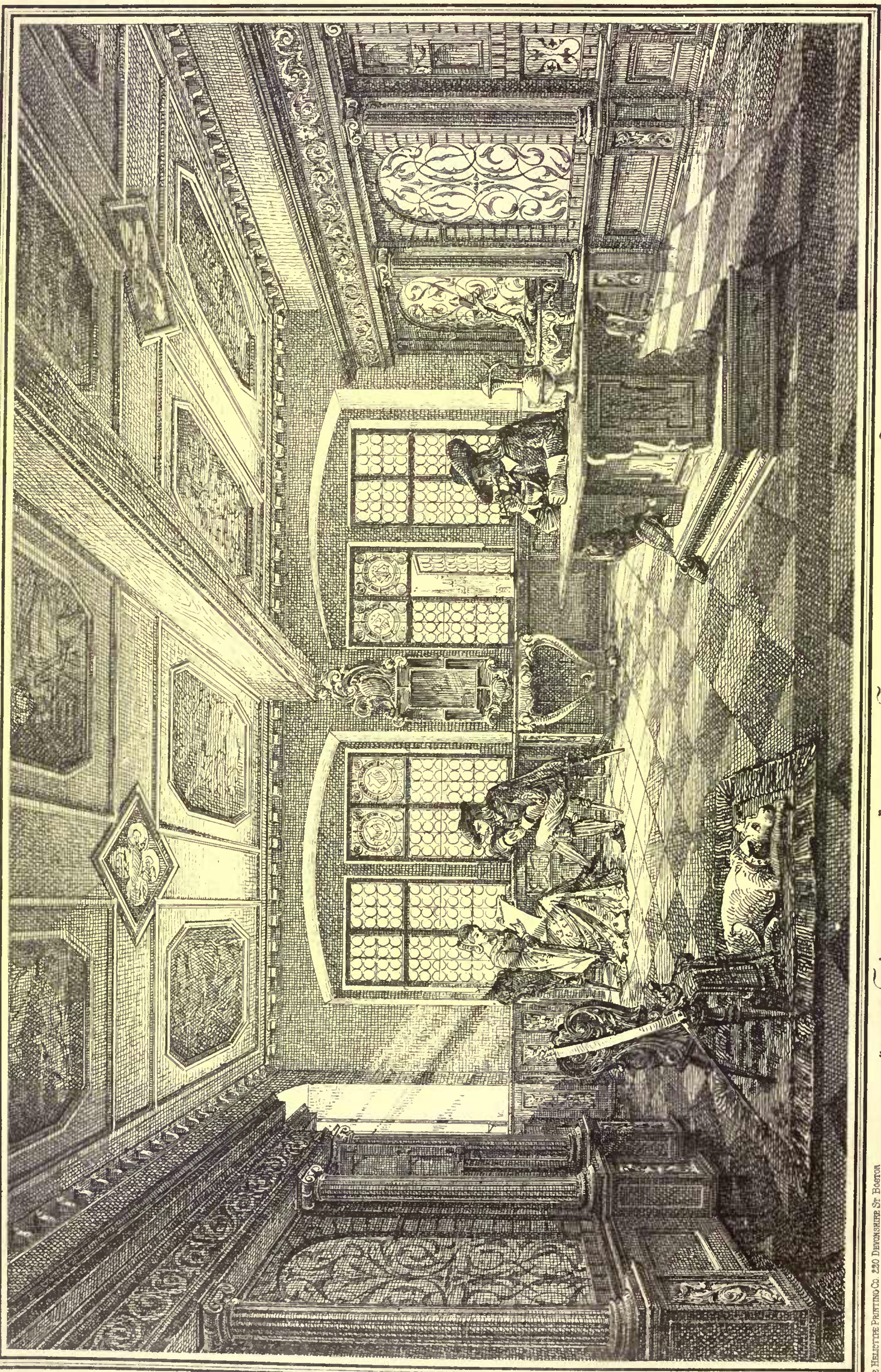
We must not lose sight of the fact, that to have the completed design a perfect and beautiful whole, unity is absolutely essential; there must be one mind to conceive and control, and whilst each artist and artisan does that which his talents make him the most competent to undertake, the architect must retain the power to assign to each one, himself included, the part he is to play in the general scheme and the general limitations under which he is to play it.

B. W.

THE ILLUSTRATIONS.

DESIGNS FOR THE HOWARD NATIONAL BANK BUILDING IN BOSTON. — MESSRS. PEABODY AND STEARNS, ARCHITECTS.

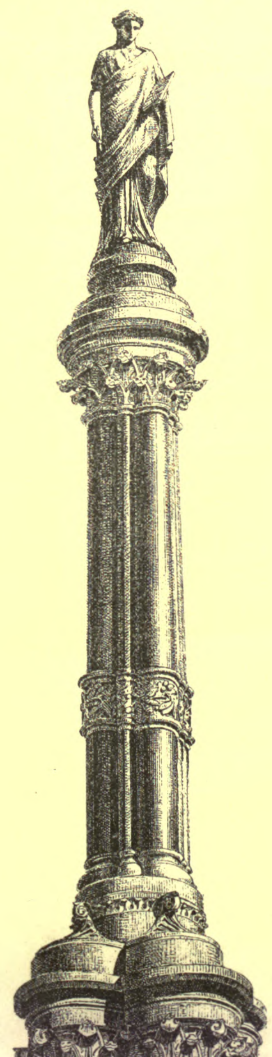
These sketches show designs prepared for two different sites. The building was put up on the wider lot, and like the sketch here given,

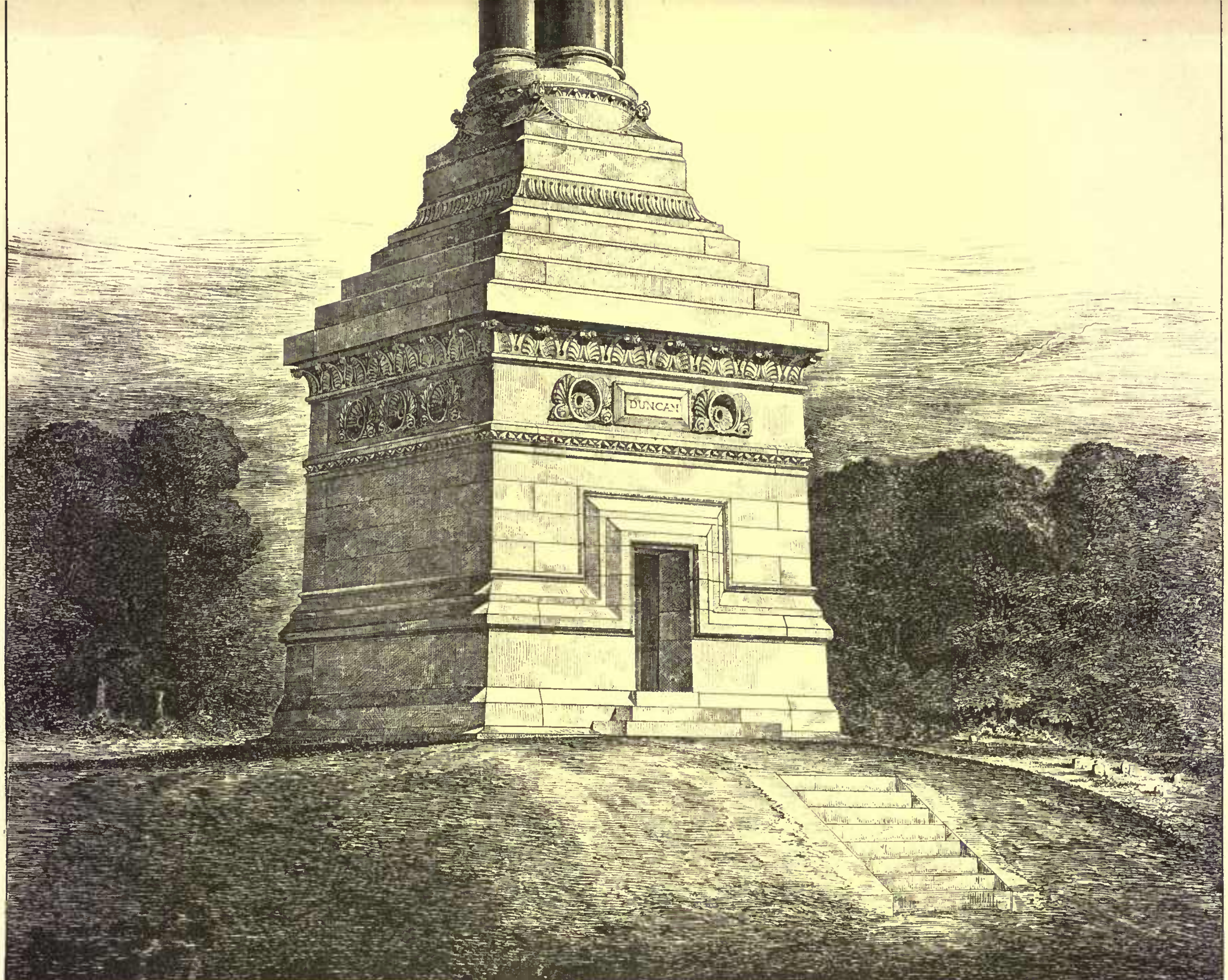


L. S. IPSEN DEL.

"HAFFNER'SCHES HAUS" ROTHENBURG A. D. TAUBER BAVARIA

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON

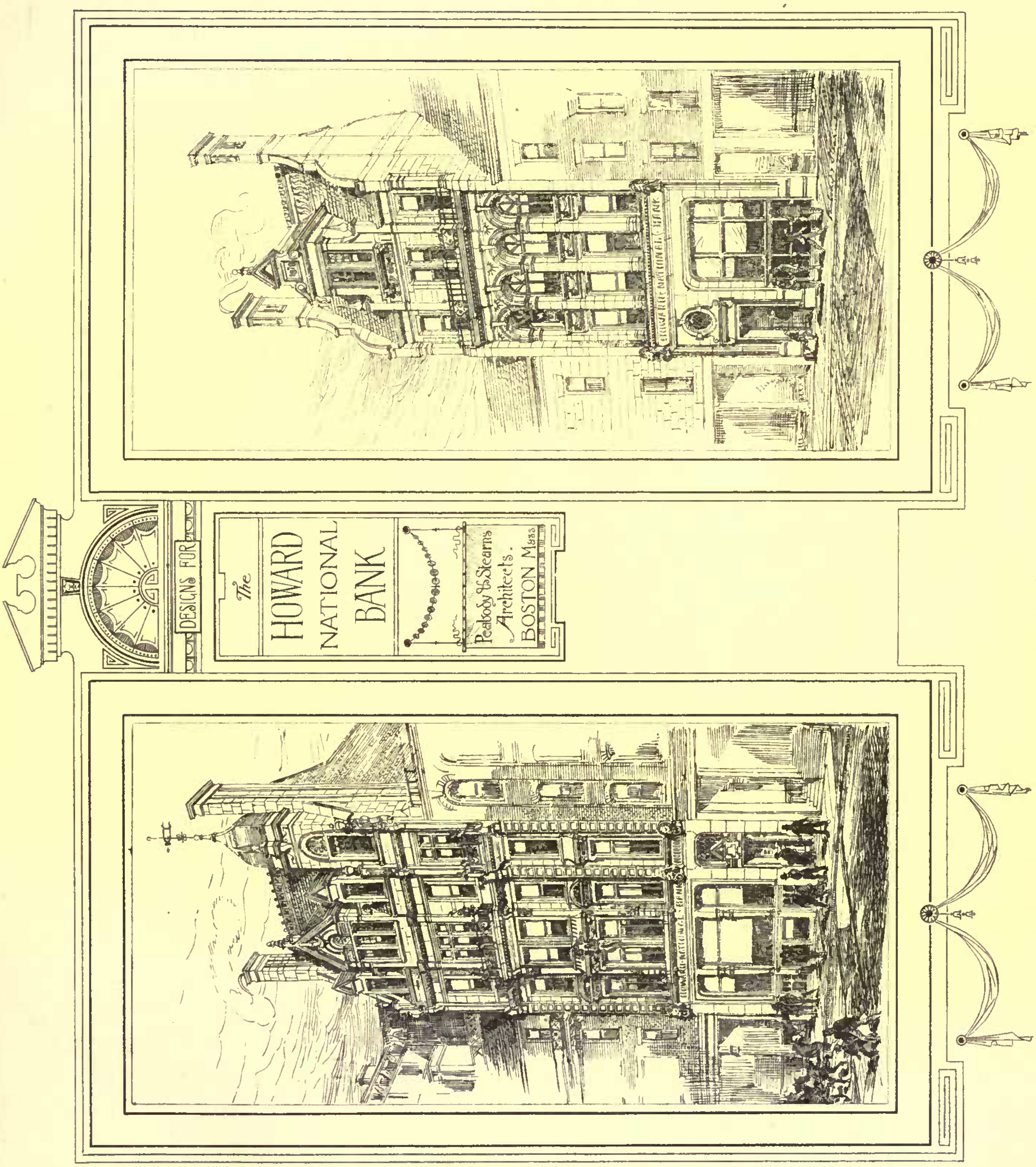




THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

MAUSOLEUM FOR THE LATE THOMAS C. DUNCAN . UNIONDALE CEMETERY ALLEGHENY-PA.

THEOPHILUS P. CHANDLER JR. ARCHITECT PHILADELPHIA



The Heliotype Printing Co. 220 Devonshire St. Boston

but without the upper story. It was decided that this would not be a profitable investment, although the building is provided with a water elevator.

MAUSOLEUM FOR THE LATE THOMAS G. DUNCAN. — MR. THEOPHILUS P. CHANDLER, JR., ARCHITECT.

This monument is to be erected in Uniondale Cemetery, Allegheny, Pennsylvania. The entire structure is to be of granite, and is being cut at Quincy, Massachusetts. It is about seventy feet high, and twenty feet square at the base. The statue of the Recording Angel has been modelled by H. Jackson Elliott, sculptor, of Baltimore. The contractors are Van-Gunden, Drumm & Young, of Philadelphia. The cost will not exceed $30 000.

THE "HAFFNER'SCHES HAUS" IN ROTHENBURG A. D. TAUBER, BAVARIA. FROM A DRAWING BY MR. L. S. IPSEN, ARCHITECT.

FIRE TRAPS.

RECENTLY I had occasion to go to a neighboring town, and while there a large house, then going up, was pointed out to me with some pride, as one of the evidences of the growth of the place. Externally it had nothing to distinguish it from hundreds of houses to be found in our New England villages, other than that it had a little more than the usual amount of gingerbread work about it, and I should not have given it another thought had I not been told that the contractor styled himself "Architect and Builder." Having learned this much, it occurred to me that possibly I might pick up an idea or two from the "practical man" (as men of this class are called), and so I turned aside to inspect the building that was intended to be an ornament and a credit to the neighborhood.

I will say nothing of the dimensions of the scantling, as compared with the size of the house, but I could not but admire the skill displayed in putting in the trusses over the doors. A bit of 3″ x 4″ joist, with square ends, was tacked in between 3″ x 4″ door studs. This served as a header. Then two other pieces were set, the feet resting on the ends of the header, and the two, at an angle, were brought together under the girt, throwing the whole weight of the girt, should it settle, upon the nails that hold the header in place — an arrangement that any "practical man" should have known to be worse than useless; but to the owner it no doubt appeared to be an evidence of good and careful workmanship. This, however, was a small matter, compared with what I saw in the kitchen.

The chimney, built for a range, had a four-inch back, which touched the sill, and the trimmer was so placed as to preclude the possibility of having any hearth. If the range is not set with a false back of brick, then the back of the range will be but four inches from the wood-work; but allowing that a false back of but four inches is put in, making in all eight inches, then the front of the range must rest on the wooden floor and over the trimmer. When finished, a sheet of zinc will probably be nailed down in front of the range, to catch the coals that may fall from the grate, and then it will be thought that every precaution has been taken against fire. The owner will be perfectly satisfied with what he sees, and he will be elated to think that he has obtained all that he wanted without having to pay an architect for his services. Everything will go well for a time, but some day, after the range has been heated to an unusual degree, to do up a lot of baking as well as to cook for the family, some one will detect the odor of burnt wood. An unsuccessful attempt will be made to trace it out, and then it will be forgotten; nor will it be thought of again till midnight, when the inmates will have barely time to escape from the burning building. The fire, in the country, will have done its work so completely before help can arrive that there will be no way of telling how it originated, and the builder, who, to save a trifle and to avoid the necessity of turning an arch and putting in a hearth, prepared the way for it, will escape censure and a just reward for his crime. I use the word advisedly; to build in this way is a crime. How many of the houses that burn down every year were built in this manner no man can tell; but we know that in hundreds of instances where a fire has been detected in time to prevent its spreading, it has been traced to such — shall I call it stupidity or rascality?

A few years ago I was called upon to prepare plans and superintend the construction of a large brick building in a neighboring State; the lower floor to be used as stores and the upper floors for offices. Each office was to have a fireplace and grate. The plans were carefully drawn and every precaution was taken to have everything connected with the chimneys and fireplaces as perfect as possible. When the building was raised the contractor took upon himself to put the trimmer and headers close to the brickwork, making it impossible to put in any kind of a brick hearth. When his attention was called to it he promised to undo what had been done and to conform strictly to the plans. Between two visits of the architect the under floor was laid, close up to the chimneys, and the ceilings were lathed. When the builder was called up for this further breach of orders, he made some paltry excuse, and added, "I assure you, sir, it is all right and just as you wanted it." "Seeing is believing," was the reply, and when the laths were pulled off he had nothing further to say, for he had been convicted on the spot of both a cheat and a lie. If what had been done had been allowed to go unnoticed, that building would have been given to the flames a dozen years ago. The builder, who had the confidence of the owner, had quite a reputation as a workman and was extensively employed. How many fire traps of this kind he had previously set it would be difficult to conjecture. Frequently there have been fires in that town, many of them quite unaccountable. The builder himself suffered in this way, but he probably never traced the fire to its source, or supposed for a moment that it was the result of his own stupidity.

The insurance companies might correct this in a measure. Would not some such plan as this reach the case? If, for example, the insurance companies were to take risks at a lower rate on houses that had been frequently inspected by their own inspectors, while they were in the course of construction, and which, through such inspection, were known to be free from fire traps — would it not be to the interest of every man who intended to build honestly to have his house so inspected? It would certainly enhance the value of a house to have it stand A 1 on the books of an insurance board; and if the owner, knowing the advantages to be derived from such a standing, failed to avail himself of it when building, such neglect, if it did not awaken suspicion, would certainly put the insurance companies on their guard. Insurance companies employ inspectors to examine buildings that have been on fire — to shut the stable door after the horse has gone — but would it not pay them better to "take the ounce of preventive," to have their own building laws, and to see, through their own employees, that they were thoroughly carried out before taking a risk on the structure? The recklessness in building in this country is something alarming, and as long as there is so little discrimination between good and bad construction, we shall continue to have these fire traps put up everywhere. "It will do," or, "It is good enough" — that is the expression, time and again, and still the insurance companies continue to pay the piper.

CHAMPLIN.

NEWPORT, R. I.

MR. SEYMOUR HADEN'S EXHIBITION OF ETCHINGS.

A FEW words as to the nature of the very valuable and beautiful exhibition for which we are indebted to the liberality of Mr. Haden. To say all that might be said in regard to such a collection would occupy far more space than we could suitably bestow upon it: a few remarks upon its leading features must suffice. The etchings, which are the work of "old masters," afford illustrations of nearly every variety of style and feeling except that which is peculiar to modern work, and of which Mr. Haden's own etchings afford brilliant examples. We can travel from the precise, minute, and realistic work of Hollar to the opposite extreme of imaginative power and freedom of handling in some of the most powerful productions of Rembrandt. One of the first things that strike us, however, is not an etching, but an engraving by Beham (portrait of the Emperor Charles V.), placed among the etchings in a spirit of impartiality, as exhibiting a triumph of expression and execution with the burin, and representing what we may take as the finest type of work which this instrument can produce in the hands of an original artist. Mr. Haden regards this also, and with good reason, as an interesting illustration of the attempt to escape from the comparative hardness and stiffness of the continuous engraved line by breaking and interrupting the lines, in a manner scarcely noticeable without very close examination, but sufficing to give a considerable softness of effect, more approaching to that of etching. In curious contrast to this are hung two works by Abraham Bosse, in which the endeavor has been to impart to etching the look of engraving, by the careful and laborious use of parallel shading lines by which the compositions (representing the interiors of a studio and a printing-room) are almost entirely modelled: not probably with the actual intention of imitating engraving, but because the practical mind of the worthy Abraham Bosse valued neatness before anything else. Except as curiosities, these works are of little value. Some works by Both and Canaletto are of interest as showing these artists through a different medium from that by which they are generally known: Both's work with the needle is fine and sympathetic; that of Canaletto we can find little admiration for, it is niggled and mechanical, and wanting in tone. Several Claude etchings that are near these are beautiful in their combined freedom, finish, and aërial effect, and the comparison of this work with his paintings cannot but raise our ideas as to the genius of the artist and the extent of his capabilities. In regard to Claude we are considerably interested by the suggestion made by Mr. Haden about the *Liber Veritatis*, to the effect that these famous and over-praised drawings were really meant as "pictorial memoranda" of the pictures which the artist had painted and the persons for whom they were painted, in order to defeat the impostures of his contemporary imitators. Mr. Haden has the boldness to say that it is a mistake to suppose that they are very precious in an art point of view; and those who think most of Claude will be most likely to agree with him. The soft landscape beauty of the Claude etchings, however, affords an almost tame enjoyment in comparison with that produced by the strong hand and over-mastering genius of Albert Dürer, in whose work we have the extraordinary combination of the most precise and hard finish with the wildest and most romantic feeling. It is unnecessary to say anything of these well-known works, except that some of the impressions here shown are peculiarly fine. Very interesting, also, it is to see some of the portrait etchings by Vandyke, in which the painter was to execute the head and other inferior artists to finish the work of adding background and accesso-

ries; it is needless to say that great value attaches to impressions taken before these additions were made, some of which are to be seen here.

Hollar is largely represented, and in despite of the absolutely prosaic turn of his art, interests one in the highest degree by his extraordinary and varied executive power and the thorough honesty of his art. His drawing of Antwerp Cathedral is a wonderful piece of solid and patiently accurate execution, yet remarkably deficient in regard to any feeling for the poetry of architecture. Yet when we turn from this to the little etching of "an English lady in a winter dress," the figure scarcely more than two inches high, and contemplate the minute delicacy of shading and modelling combined with really broad and forcible effect which this little work illustrates, we must form the very highest idea of Hollar's power of doing what he liked with his materials, and of being, when he chose, realistic without hardness. In his views of buildings the desire for rigid topographical accuracy appears to have stood in the way of artistic effect with him: this, of course, gives them a remarkable value as pictorial records; but the poetic element is at a minimum in his works, if it can be said to exist at all, and we certainly cannot, like Mr. Haden, see "everything" in Hollar, except in regard to mere technique. Nor can we share his enthusiasm about Karl du Jardin in the sense in which he expresses it; what strikes us, at all events, in the works exhibited here is not so much the tranquil or "tranquilizing" feeling of which Mr. Haden speaks, as the supremely able drawing in such a work as "The Two Horses;" the animal lying down and foreshortened is a masterpiece: even Paul Potter's "Chevaux de Charrue," of which there is an impression on the opposite wall, must yield to this.

Of the etchings of Ostade and those of Rembrandt which are exhibited, it is hardly possible to speak here, because one feels that one must say so much if one says anything. The Ostades are only seven in number, but they are examples of perfect balance in composition and manipulation which it would be difficult to match from any other hand. In mentioning them in the same sentence with Rembrandt, however, we by no means intend to imply any possibility of comparison between these works of consummate art, but restricted subject and feeling, and the great world of Rembrandt's art. Forty of the etchings of Rembrandt are placed here, and the contemplation of them fills one with a sort of wonder. There may be no single work with precisely the balance of style of Ostade, for the well-known "Burgomaster Six" is *over*-finished, and so unlike the usual aim of Rembrandt that Mr. Haden suggests that it was a special treatment adopted by the artist to please his friend the sitter. But if we look from one to another of the works in which Rembrandt was expressing that which was really and inherently characteristic of his genius, the expression employed above does not appear too large: his productions fill a whole world of feeling in themselves. Looking at the delicacy of such works as his little portrait of himself (the head only) with a fur cap, and the portrait of his mother before mentioned; then at the curiously chivalresque and cavalier style of the better-known half-length of himself, with cloak and feathered hat, in which he almost seems to have beaten Rubens on his own ground; then at the rich sensuous fulness and ripeness of execution and feeling in that portrait of his wife, Saskia, evidently executed in every sense *con amore*; and then pass to the tenderly pathetic sketch of "The dying Saskia;" and then come on a landscape ("The Three Trees") which even Turner has never surpassed,—and so on, through the list, we feel a sort of awe before the power and pathos of this marvellous self-educated genius, the culmination of whose power is fitly shown in that tremendous etching of "The Crucifixion,"—a thing which it is impossible to analyze, but which we feel is above all rules and criticisms of art, which Rembrandt only dared have done, and which no one after him could imitate with any chance of success.—*The Builder*.

THE SANITARY CONDITION OF TENEMENT HOUSES.

It is a very sweeping assertion to say, yet I do say without the least hesitation, and fully understanding all that it implies, that every tenement house in New York or elsewhere which was built so long as five years ago ought to have its whole drainage system entirely removed and replaced by the very best work of which the modern art of plumbing is capable, arranged according to the very best plan which modern sanitary knowledge can devise. I date back five years as a saving clause. It is possible, but it certainly is not probable, that a few of the more modern tenement houses may be properly drained. The objection will naturally be raised that to compel the owners of these houses to undertake such costly work would be a hardship, if not an actual invasion of their private rights. The objection is of no value. Capitalists of the class under consideration depend for their income upon the necessities of ignorant, heedless, and helpless people,—of men, women, and children who hold their lives daily subject to the most imminent danger.

A great outcry is raised against the bad sewers of the older parts of all our cities, and they are bad enough to justify the outcry. At the same time, the houses connected with them get their bad effect only at arm's length, and they need not get it at all. As at present arranged, there is no doubt that they do receive an injurious amount of sewer gas from them. At the same time, there is just as little doubt that their own private drains, soil-pipes, and waste-pipes are active and constant producers of equally deleterious gases, sufficient to account for the unhealthy condition which is so often ascribed exclusively to the sewer in the street.

It would be a comparatively small matter so to disconnect every house from the sewer that it need be in no danger of an invasion of its gases. If only this were needed to remove the drain diseases which we know to be so rife, our problem would be a very simple one. Unfortunately what is needed is very much more serious than this, and must be very much more costly.

The health officers of every city know, or it is their duty to learn, and they may learn very easily, the relations existing between defective drains and waste-pipes and the ill-health of those who live in houses containing them. This knowledge must qualify them to pass a decree of absolute condemnation against every one of these wrongly arranged and badly constructed appliances. Trashy soil-pipes, imperfectly jointed, unventilated, unflushed, and inadequately supported, as they exist in so many of our tenement houses; corroded waste-pipes, half choked with foul accumulations and sagging in their course; traps so shallow, so badly placed, and so badly arranged that they are traps only to catch those who trust them; and open-mouthed sink-wastes, pouring their mephitic exhalations into the interior of close and closely-packed houses,—to say nothing of the worst possible water-closets in the worst possible condition,—these are the rule, not the exception, in nearly all our tenement houses. Even where inspection is rigid, and it is probably nowhere more so than in New York city, the standard by which plumbing is measured is by no means that of the best modern work; it is not even that of the "first-class" houses up-town. It should be, and if tenement houses are to be made fit residences for the poor, the overworked, and the careless, it *must* be something very much higher and better.—*Colonel Waring, in The Plumber.*

CORRESPONDENCE.

CINCINNATI.

The periodical fever about the erection of a new Merchants' Exchange is fully on again, and it seems to have broken out with greater fury than ever before. A committee from the Exchange have been in search of a site for some time past, and within a week this committee reported unanimously in favor of the southeast corner of Fourth and Elm streets, extending down Elm Street to McFarland Street, which is one hundred and fifty feet, the lot being one hundred feet on Fourth Street. This is certainly a fine corner, but there is a very strong feeling among the merchants at large that the site is too far west, and there seems no doubt that a site further east will be ultimately agreed upon.

And now is exhibited the usual rush and greed of the profession when there is any game in the field. Invited or uninvited, the architects are submitting plans and elevations and suggestions of every tongue and creed, even before a site has been selected whereon to erect their imaginary chambers of commerce. Descriptions of these structures (that are to be) are appearing in the daily press just as if plans had been adopted and the work commenced. This undue haste on the part of the architects looks as if each one expected to forestall the market, to the exclusion of all others, by having his particular plan appear in the daily newspaper. We are of the opinion that this action on the part of architects does not tend to build up in the public mind that esteem and respect the profession so earnestly desires and which is accorded to other professions.

THE ELECTRIC LIGHT.

The *Cleveland Leader* says that Mr. Brush, of that city, has recently made improvements in electric lighting which surpass all other inventions in brilliancy of illumination and in economy. He has lately made a machine for one of the largest cotton mills in New England. It is a machine which absorbs about fourteen horse-power, and produces in a single circuit eighteen powerful steady lights of two thousand candle-power each. At the time of the reporter's call, the machine was undergoing its final test. The eighteen lamps in the row upon the fourth story were all burning in varnished glass boxes, so that their operation could be closely studied without injury to the eye, while the machine was being propelled on the ground floor. These eighteen lamps will be in eighteen different rooms of the great factory, and will furnish light equal to the mid-day in brilliancy. When the lighting is desired, it is not necessary to give any attention to the various lights, but simply to turn the band upon the shaft and start the machine in motion, when instantly all the lights in the circuit burst forth into brilliancy. A very ingenious device in the lamps prevents any particular one from getting more than its share of the voltaic arc, and another device allows any lamp to be temporarily cut out of the circuit without disturbing the rest in the least. In case an accident should happen to any lamp which prevents it from burning, it is instantly cut out of the circuit and remains out, allowing all the rest to burn until the lamp is in its normal condition, when it relights itself. In the eighteen Brush lamps the total cost of the carbon consumed in all the lamps is seventy-two cents per hour, each light being equal to two thousand candles, and lasting eight hours without attention. The difference over the French system is about six to one in favor of that of Brush, says the *Leader*.

The Van der Weyde electric light was employed lately to illuminate Regent Street. The test it underwent was more than usually severe, for at the West End house after house had gas jets in celebration of the Prince of Wales's birthday, and many had huge flambeaux of gas. But the electric light at No. 182 overpowered all, and served to show the incomparable superiority of electricity to gas as a means of illumination. The new light was everything, while gas-light was as nothing. The people stood gazing at the illuminator until obliged to move on by the pressure of the crowd, a proof that there are no ill effects upon the eyes. The exhibit was not in a lamp form, as at the Gaiety Theatre; but the light streamed from a large concave cover, placed at an angle of about forty-five degrees, in the second floor. There was a disc of porcelain between the carbon point and the space illuminated by the light, so that only reflected rays were seen. The motive power is given by an eight-horse-power gas-engine working in the basement of the house, and this requires no attention. The carbon point, when the lighting commenced, was a foot in length, and after four hours' burning only six inches had been consumed, so that one point may be fairly estimated to burn at least six hours; placing a new point in will occupy only a few seconds. — *London Times.*

FACTORY CHIMNEY SHAFTS.

In a recent paper read by Mr. R. M. Bancroft before the Civil and Mechanical Engineers' Society, some practical details on chimney construction are given. Referring to foundations, great care is necessary to insure an equally resisting bed upon which to build, and the author wisely suggests the importance of boring so as to insure this condition. Concrete may considerably aid in spreading the pressure of a lofty shaft over a large area, but the pressure of wind exercising a considerable leverage has caused many chimneys to lean or topple over. A gale often strikes a shaft, causing one part of the foundation, the leeward side, to sustain a pressure considerably greater than the normal and vertical weight of the shaft, and numerous instances are on record where stacks from this cause have become considerably deflected from the perpendicular. There is greater risk from a gale of wind when the mortar is not solidified. An instance of the effect of a gale on a lofty chimney is given by Mr. Bancroft in the Townsend Chimney, Port Dundas, the height of which is 468 feet to top of coping. It was designed by Mr. Robert Corbett, of Glasgow, for Mr. Joseph Townsend's Chemical Works. No piles were used in the foundation, which is built on "blue till" or clay of rock-like compactness. The footings consist of 30 courses, brick on edge, the lowest being 50 feet, and the topmost course 32 feet diameter, and the erection of the shaft was carried on from July, 1857, until October, in 1859, in three seasons. The inside lining is of 9-inch fire-brick, and 60 feet in height, built distinct from the chimney, with an air space between, covered on top to prevent dust from falling in, but built with open work in the upper four courses to allow air to pass into the chimney. The shaft is coped with vitrified "till," flanged over wall of chimney, and jointed in Portland cement. Iron hoops are built in at intervals of 25 feet in height, and the thickness of the chimney wall varies from 5 feet 2 inches for the first 60 feet of height, to 1 foot 2 inches for the last 20 feet, and the sections are in 30, 40, and 52 feet heights. In September, 1859, the chimney was struck by a gale, which caused it to sway, also the scaffolding on one side to give a little, and had not the process of sawing been promptly commenced it is thought that the chimney would have fallen. By this process the shaft was restored. The shaft is protected from lightning by two copper-wire conductors, one half inch thick, placed on opposite sides, joined to one pike, fixed over the top; which, however, have not prevented damage to the shaft by the electric discharge on several occasions. The ordinary pressure of chimney shafts on the foundations may be taken to be from 5 to 10 tons per square foot. Various chimney shafts are mentioned in which a deflection has taken place, the ordinary means of restoration to the vertical being by making saw cuts on the side of shaft opposite to the inclination. Another and often more practicable plan in thick shafts is to remove a layer of bricks on the required side, replacing it by a thinner layer at different intervals in the height of shaft. Care should be taken, however, not to make the slits too wide, or an inclination is produced in an opposite direction to that intended to be rectified. Another plan has been to weight the foundation on the side opposite to the deflection, and one successful case is mentioned. Messrs. Edward Brooks & Sons' chimney, of the Fire Clay Works, Huddersfield, is of fire-clay, 330 feet high, the shaft being 27 feet diameter at ground, and 12 feet at top, outside. The proprietors recommend one regular batter from bottom to top, that no stones should be used at the top of chimneys where acids are emitted, and that any overlapping should be formed by hard-burnt radiated fire-brick, 14 inches by 5 inches by 3 inches. In the north of England, cavity chimneys are often built, in which the inner ring is carried up vertically of 4½-inch fire-brick for 20 or 30 feet, the main outer shaft closing with it as it diminishes or batters to the top. The outer shaft is often 14 inches thick at the base. We cannot here detail the many other useful particulars furnished by Mr. Bancroft in his instructive paper, in which he classifies about forty chimneys, giving the height, diameter, diminution of shaft, weight in tons, number of bricks used, cost of erection and scaffolding, the architect or engineer's name, and the time occupied in building. Many of these particulars are incomplete, but the data given will be found useful by all builders of this class of erection. — *Building News.*

STEAM HEATING; THE HOLLY SYSTEM.

The citizens of Utica are moving in the matter of forming a company to introduce the Holly system of steam heating in that place. They recently sent a committee to Lockport to examine the system, and Mr. Edward Martin, a mechanic, made the following verbal report of what he saw: —

The system was first experimented upon in that city last winter, and now the majority of the people of Lockport are deeply interested in the enterprise. Two boilers are used at the headquarters, of from 60 to 80 horse-power. They consume about three tons of coal per day, and at present about 150 buildings, including churches, schools, dwellings, and stores, are heated through one mile and one third of pipes. But two attendants are required at the boilers, — one day fireman, who receives $1 per day, and the night fireman, to whom $1.25 is paid. Four inch mains are used. They are covered with asbestos, and laid not over three feet underground, within pump logs (to prevent condensation), which are laid in U-shaped drain-tile to keep the moisture away. "Junction boxes" are placed in the mains, at the distance of every 100 feet. These are intended to collect the water that is condensed from the steam, and this is the patent which the Holly company controls. The attachments for all buildings are made at these boxes, as the mains are not tapped in other places. The simple mechanism of the junction boxes causes the water condensed from the steam to be forced into the house pipes, and thus the mains are kept clear for the free passage of steam. The supply pipes only range in size from one half to one and one half inches, and attached to them are regulators which govern the amount of steam used. The water from the mains, being forced into the small supply pipes with the steam, becomes vaporized or converted into steam main, but is again condensed, and may be drawn off within the house. Where there are no customers within 100 feet distance on the main, the water is trapped off into the sewers. The steam is led into the common form of radiators now used, or, simpler still, into one formed of two-inch tin pipes, which heat very quickly and give out a pleasant heat. On the day of the committee's visit there was 30 pounds pressure in the boilers at headquarters. The pressure in the houses was much smaller, and by the diminution of the pipes can be reduced as low as desirable. With the tin radiators which are in general use at Lockport there is little or no pressure, the steam being admitted through a small aperture in the top. Water was boiled in three minutes by the use of the live steam in the radiators in a private house. The steam is to be measured by a meter something like that used for gas and water. The expense of newly fitting houses, stores, and churches ready for using steam ranges is from $125 to $400, governed entirely by the number and style of the radiators. All styles of pipes and radiators for steam heating now in use can be utilized for the new system, and the boilers and furnaces can be taken out.

The schedule of rates for heating was not obtained, as the meter form of measurement is new, and the prices are not fixed. The company now agrees to heat buildings for the amount now paid by the occupants for their coal for heating purposes. The economy of the system is this: It saves the cost of the stoves, furnaces, and boilers now employed in each building, store, and office or apartment, and the amount paid out for the wear and tear of the same; it saves the expense and annoyance of caring for the heating apparatus in each building, the handling of coal, ashes, cinders, etc., and above all does away with all risks from fires, carelessness, etc. Like water and gas, the steam is at the command of the consumer at all times by simply turning a valve. Steam stoves for cooking and washing have been invented, and an attachment can be made in every room which will fill it with steam and extinguish fires immediately. Direct or indirect radiation, or both, can be used. The mains can be laid under the roadways or sidewalks, or passed through the cellars of entire blocks. The loss of pressure at the end of a mile main is not over five per cent. — *Troy Times.*

THE REGINA MONUMENT.

We have already noticed the discovery of the sepulchral monument exhumed at South Shields at the close of last month. Mr. W. de G. Birch of the British Museum, who exhibited a paper cast of the inscriptions to the British Archæological Association on the 20th of November, contributes a paper upon the monument to the forthcoming "Transactions" of that body. Professor Wright, of Cambridge, will give a paper upon the inscriptions in a future number of the "Transactions" of the Society of Biblical Archæology; and Mr. Llewellynn Jewett, F. S. A., will have a representation of the sculpture in the *Reliquary*. Thus in a short time the public will be supplied with all the information that can be given about this acquisition.

The monument was found by some workmen who were excavating at a considerable depth at the back of Bath Street, South Shields, the site of a Roman cemetery, believed by Dr. Hooppell to be the ancient *Tunnocelum.* The material is a close, warm-tinted sandstone. The height to the top of the arch is four feet six inches, to the top of the sides three feet seven inches. The breadth is two feet three inches and a half. The design is as follows: Upon a broad

plinth, the face of which is about twenty-eight inches by eight, two Corinthian columns, with ornamental double capitals, support a hollow pediment. Within the niche thus formed is seated a female figure, upon a chair of basket-work; her face has been destroyed, but the drapery is neatly disposed, and there are some indications of jewelry or ornaments round the neck and at the wrists. The head is adorned with a broad circular ornament, which may be intended for a nimbus, a *meniskos*, or a turban, for the mutilation of this part of the figure prevents the identification of this object. The left hand of the figure reclines upon her knee; in it she holds what may be a pomegranate, an ear of maize, or an artichoke. In a cylindrical basket on this side of the figure are other offerings of the same kind. The right hand is placed upon an altar with a square base, which has in front, clearly marked, a well-defined crescent moon. This crescent probably is the emblem of that deity to whom the deceased woman is making an offering. The face of the plinth has three lines of Latin: —

DM · REGINA · LIBERTA · ET · CONIVGE ·
BARATES · PALMYRENVS · NATIONE ·
CATVALLAVNA · AN · XXX.

According to the usual formulæ of Roman sepulchral epigraphy, the dative rather than the ablative case should have been found in the first line. There is, too, a difficulty with the third line, the first word of which may be an adjective referring to *natione*, and setting forth the status of the woman who was at first the *slave*, then the *liberta*, and finally the *wife* of her former *master*; or it may be the name of the town to which she belonged. In this latter case *natione* must be taken with the word which precedes it, and so refer to the man Barates. *Regina* has been by some thought to be an Oriental appellation, but the "Altdeutsches Namenbuch" of Dr. Ernst Förstemann shows that the root *Ragan* (Consilium) enters largely into Western European names; *Regina*, itself a derivative, occurring in several passages quoted by this author. *Catuallauna* recalls the northern tribe, whose name is yet current among us in the familiar Welsh form of Cadwallader. Below the Latin is a single line of Palmyrene, thus deciphered: "Regina Bath-Hêrê, Bar'atê, habal," the Latin equivalent of which is "Regina liberta Baratis, eheu!" The name of Barates may possibly give us the clue to the deity whose emblem is shown upon the altar above, for Ate is a well-known member of ancient Semitic mythologies, and Barates would, with his wife and household, naturally pay his devotions to the god of whom he himself was styled the son, that is, the worshipper or follower. — *The Athenæum.*

NOTES AND CLIPPINGS.

A subscriber writes to ask us what is the condition of the building trades in St. Paul, Minnesota, and what are the wages of plasterers there. Can any of our readers inform us?

High Building in New York. — There is a marked development, of late, of lofty buildings in the business part of the city. Some years ago, when the Tribune building was in course of erection, that paper predicted that the style of business building, of which that structure was about the only example, would become general in this city, where the narrowness of Manhattan Island crowds the commerce of a continent into about a ten-acre lot; that with the universal use of elevators people would be just as willing to have offices in the seventh or eighth story as in the first. The prediction seemed a long way from fulfilment then, but now it may almost be said to be verified. Just one door below the Tribune, on the corner of Nassau and Beekman streets, where the old Park Hotel has stood for a number of years, a massive brick building for offices has already reached its seventh story, and is going higher. It looms up already above all the surrounding buildings but the Tribune, and seems almost like its rival, being built in a style imitating that of the Tribune somewhat. Down near Trinity Church, on Broadway, the new Boreel building is in process of construction; it is owned by Mrs. Boreel, who hails from the Astors. This has a high basement, high enough for handsome offices, a lofty first story suitable for a bank or insurance company, and five stories above that. It is a large building, and will use four elevators. There are others like these now building. Indeed, the stranger who approaches New York by the harbor sees now an imposing array of lofty buildings where there used to be very few. The Tribune towers above them all, but there are, besides the new buildings on Nassau street, the Evening Post and Western Union Telegraph buildings on Broadway; the Mutual and Equitable insurance buildings; the Coal and Iron Exchange; the Boreel building, and half a dozen others, which give to a bird's eye view of the city a look of real grandeur. What with the elevated roads and the nine-story buildings, New York will soon assume the appearance of a city built in several stories, and only needing a mansard roof. — *Cincinnati Gazette.*

The New York Water Front. — The improvement of the water front has gone steadily forward; new piers have been built and old ones repaired; the bulkhead wall has made progress; the section between Canal and West Eleventh streets, intended for the accommodation of foreign steamers, and the territory leased to the Erie Road above Warren Street, are being rapidly improved; and the revenues of the Department have exceeded the entire expenditures by $223,745. Instead, therefore, of an increase of the city debt by the work on the water front, there is an actual reduction. The Commissioners estimate that the revenues of the Department will in a comparatively short time reach the sum of $1,000,000 annually. It is intimated that the demand for cheaper wharf-rents is about to be met by the construction of up-town piers at points where local business does not create the lively competition which puts up prices.

A New Method of planting Telegraph Poles. — A new method of planting telegraph poles has been introduced in Pennsylvania. The ground is staked off at distances of 200 feet apart; a man starts off with cartridges of "electric powder," and with a crow-bar in his hand. The bar is driven four or five feet into the ground, a cartridge with a lighted fuse is dropped into the hole, and the man proceeds to the next stake, but before he reaches it the cartridge has exploded, making a cavity as big as a flour barrel in the ground, and a gang of men who follow plant a telegraph pole in the spot. In this way four men will set up 100 to 150 poles per day, and at a cost two thirds less than by the old way.

Robert Wallis. — Robert Wallis, a distinguished landscape engraver, died in London on the 23d ultimo, at the age of 84. He engraved many of Turner's pictures.

The Proposed North River Tunnel. — Mr. Trenor W. Park, the New England Railroad operator, and Tom Scott, of Pennsylvania, have been in New York to make arrangements for pushing the work of tunnelling under the Hudson River between New York and Jersey City. A number of Chicago men are taking hold of the enterprise. About $10,000,000 will be required to do the work. The route has been surveyed and requires the tunnel to be three miles long. The inclination will be very slight, and the work when once completed will cost nothing for repairs. The tunnel proprietors will be identical with the Steam Railroad Company, running the entire length.

Workshops at the University of Cambridge, England. — At the University of Cambridge, England, it is said, mechanical workshops have been fitted up with machinery for the construction of instruments and apparatus to be employed in philosophical research. Good workmen have been employed as teachers. Several University men, who intend becoming engineers, have become members of the classes now formed for regular instruction in the use of tools and machine construction.

An Historic Building Burned. — On Christmas day a fire was discovered in the dwelling house known as the old Dongan mansion, on Richmond terrace, West New Brighton, Staten Island. The building was entirely consumed, but the furniture was all removed with very slight damage. This was one of the noted dwellings of historic interest, having been built in the year 1668 by the Colonial Governor, Colonel Thomas Dongan, who was afterwards known as the Earl of Limerick. The house had been externally modernized in some degree, but the oak frame hewn out of the adjacent forest is the identical one erected by the Governor, the date of the building having been marked upon one of the timbers with white paint.

Statues for the Hartford Capitol. — Of the twelve marble figures intended to adorn the base of the dome proper of the new Capitol — a position on the dome tower, elevated seventy-five feet above the roof — five or six are already nearly finished, under the chisels of the sculptors at Batterson's. These statues are various symbolical figures, eight feet high, and when placed in position will add much to the effect of the dome. They are cut out of blocks of imported marble that weigh about eight tons apiece. Next spring the work of elevating the statues to their position will begin.

The French Exhibition. — It is thought that a large part of the present Paris Exhibition will be transferred to Sydenham Palace, in London, for a permanent museum of art and industry, as also a bazar where sales of the articles from Paris can be effected from samples. This is in large measure the controlling idea of the Permanent Exhibition at Philadelphia.

A Porcelain Factory. — An effort is to be made to restore to Philadelphia the industry of porcelain making, which flourished there from 1816 to 1837. The pottery ware manufactured by William Ellis Tucker and his successors during that period was the best in America, but, the business dying out, the manufacture was discontinued. Now that ceramic goods and bric-a-brac are the rage, a factory is to be established in this city to supply the demand and secure the trade which now goes to England and the Continent.

In connection with this there will be a school, where the art of modelling, designing, and decorating may be acquired. One impediment is the high price of ground in a suitable location, and a spot has been selected south of Girard Avenue, and cut off from the Zoölogical Garden by the embankments of the Pennsylvania and Junction railroads. The Park Commissioners, however, have no power to lease or sell Park property, and an act of the Legislature will be necessary to overcome the difficulty.

A Curious Stone. — A remarkably curious stone has lately been discovered in the Eternal City, on which is engraved an inscription of the time of Adrian. It concerns a circus driver of the name of Crescens, who, in less than two years, realized a considerable fortune by the victories he obtained in the public games. Crescens was of Moorish origin, and was twenty-two years old when he contested for the first time at the fêtes given on the birthday of Nerva. On that occasion he was the twenty fourth to start, a circumstance which seems to indicate that a system even then existed somewhat analogous to what we call handicapping, as the car driver or the animals he drove had probably previously gained some victories, or were considered as too powerful for the rest of the competitors. Crescens has bequeathed to posterity the names of the horses which contributed to his victories. They were Circius, Acceptor, Delicatus, and Colonus, appellations which refer to the qualities or exploits of the animals. As we have mentioned above, Crescens was only twenty-two when he commenced his career, which terminated two years later. He took part in 686 contests; he gained 47 first prizes, 130 second, and 111 third. Only on one occasion was he placed in advance of his rivals, and thirty times, when he was put in the last rank, he regained the advantage his competitors had received. He won in money 1,553,346 sesterces, about 312,000 francs, estimating the sesterce at twenty centimes. — *Troy Times.*

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

THE Chicago Court House continues to furnish opportunities for embarrrassment and controversy to those who are in charge of it, and for amusement to the rest of the world, or to so much of it as has its attention called to the building. The difficult question, how a court house should be built with half a dome, having been decided at last by suppressing the dome altogether; the other question, whether the two halves of a building may be built of different kinds of stone under a contract that requires them to be of the same design, having been determined in the affirmative, and the correlative one, whether one half of it may be a story higher than its fellow, in the negative (we believe); and the architect of the city half having been turned adrift with his plans, leaving the field in possession of the county architect and his, — there has been an end of architectural controversy, so far as appears, until it has come to the point of deciding what shall be done with the connecting wing in which the two halves unite. For the solution of this difficulty a conference of the city and county commissions was lately held, at which Mr. Egan, the architect of the county and designer of the building, submitted his plan for the "rotunda embellished with a triumphal arch," which is to be the connecting feature, and urged that a compromise in the matter of the stone was really necessary at this point, proposing that neither of the two discordant stones of which the halves are built should be employed in the arch, but that some kind of marble should be used instead. Thereupon an order was passed that Mr. Egan, on the part of the county, and Mr. Cleveland, the superintendent of buildings, who is in charge of the city's half, should prepare a design for the connecting arches, leaving off the fourth story over the arch and the balustrade over the roof; but no comfort was given to the architect on the subject of his chief perplexity, in spite of his protest, which does not sound unreasonable, that "it would never do to have one half of the arch built of white and the other of black stone."

THE new Brooklyn, or King's County, jail is another building that was born to a stormy life. It is a year and more since, after a tempestuous scene among the board of supervisors, Mr. Mundell was chosen architect for the jail, and his plans adopted, with the stipulation that the jail should not cost more than three hundred thousand dollars. But in the mean time, under the pressure of hard times, and in the interest of a becoming economy, it has been decided that only half a jail shall be built for the present; and the architect has accordingly carried out his plans so far that the contracts for a single wing have been executed, and the work is to begin at once. This, however, is but the signal for treble thunders of the war that for a space did fail, and the people of Brooklyn are in hot anger at discovering that the one wing to which their wise economy restricts them will cost about five sixths of their original allowance, the contracts awarded at the outset amounting to $238,700. This anger was reinforced by the fury of disappointed contractors when it appeared that some discrimination had been made among them, and that the contracts had not been given to the lowest bidders. On the strength of this there are threats of an injunction to restrain the supervisors from carrying out their contract, and even of an effort to throw over Mr. Mundell's plan at this late day, and procure a cheaper one by competition. It would not be surprising, nevertheless, if the storm should gradually subside, as such storms usually do, and the supervisors should have their way.

THE points made in favor of the successful contractors were that they were King's County men, and men who, being known to be responsible, could be trusted to do thorough work. This spirit of condensed patriotism was so active that it was made a condition of all the bids for stonework that the cutting should be done in Brooklyn, though it was known that the cost of the work would be thereby increased, and in the face of considerable opposition on that account. No heed was paid to the argument of one of the supervisors, who urged discreetly that if the successful contractor should choose to disregard the stipulation, there would be no efficient remedy, since the county could only resort to an injunction, or to a suit for damages; for an injunction could only injure the county by delaying the work, while if the county suffered no loss by having the cutting done outside, there would be no damages to recover. In view of a petition from two hundred or more stone-cutters of Brooklyn, asking that the stonework should be given only to Brooklyn men, which petition was presented by the mover of the restriction, the true inwardness of the action hardly needed the illustration of a member who protested against making political capital out of the business.

THE students and graduates of the architectural department of the Massachusetts Institute of Technology have formed a society calling themselves the Architectural Association of the institute, of which one of the objects is of interest to the profession at large. They propose to "establish a bureau for the purpose of obtaining employment for past members of the department, which shall keep a list of names and residences of all members of the association, also the year in which they left the department; and which shall upon application furnish all architects with the names and addresses of unemployed draughtsmen in their neighborhood. This industrial bureau shall be thrown open to draughtsmen not otherwise connected with this association, on payment of suitable fees." Such a bureau, if well conducted, may be of great use both to architects and to draughtsmen. An architect's business is fluctuating: when work presses he is glad of an opportunity to increase his force, and when work fails he has to cut it down. Every office therefore wants, besides its permanent draughtsmen, others on whom it can call at short notice in time of need. In busy seasons there is much passing and repassing of draughtsmen from office to office as there is pressure of work in one or another, and a bureau where at any time information can be got of those who are ready for employment ought to be very serviceable. In the preliminary circular sent out it is queried whether the bureau should assume to recommend candidates or guarantee their claims, or should only make them known. Undoubtedly such a guaranty would be of considerable importance if it were practicable to give it. This, however, is a question of administration. If this were not practicable, — and we should think it would be difficult, — a concise record of every man's experience, of the study he had gone through, and the architects with whom he had worked, would still be valuable.

AT the time of the English Congress of Architects last summer, Mr. Burges sent to the Council of the Royal Institute of British Architects, under whose direction the Congress was held, a series of questions of every-day importance concerning architectural practice which he proposed for discussion at the Congress. They were received too late, the authorities said, to be considered in the scheme of the debates of the Congress, but a few weeks ago the Council of the Institute sent Mr. Burges a series of answers to the questions for his personal satisfaction. The satisfaction seems not to have been complete, however, for he wrote to the Secretary of the Institute for further explanation of one or two of them, with the inquiry whether he was at liberty to publish the answers of the Council. How far the patience of the Council had been taxed we do not know, but there is a rather crisp ring in their answer, that they have nothing to add to what they have said, which in their opinion has sufficiently dealt with the questions, and that their answers are confidential. Mr. Burges, thereupon, publishes in the

Architect his list of innocent-looking queries, with a corresponding blank column for answers, but simply marked "confidential." The queries are of a kind to stimulate curiosity — and apparently most natural. They include inquiries about the number of sets of tracings which an architect is to furnish and who shall bear the cost of duplicates, the rule of practice propounded by the Institute being that the architect is expected to provide one set, which presumably goes to the builder. More searching, probably, are the inquiries whether it is professional for an architect to advertise; whether he should apply for work or offer his services to people not his personal friends; and whether he should share in the profits of any trading firm in which his name did not appear. It is possible that Mr. Burges, whose ideas of practice are more uncompromising than those of some of his fellows, intended his questions as an irritant to his less sensitive brethren; at least we may guess that a plain public declaration from the council concerning some of the queries, especially that which refers to drumming for work, would have touched men who are of standing in the Institute. Nevertheless the disinterested outsider does not read the list of questions without a feeling of disappointment at seeing that the answers are left blank. They are questions on which an authoritative declaration is desirable. The Institute may reasonably prefer to choose its own time and manner of making known its doctrine, but a firm statement from the men of strong position in the profession everywhere might do much good to the weaker brethren.

Inability to realize the burdens of their employers apparently keeps the workingmen of England still busy with strikes. The Oldham strikes, which we mentioned not long ago, have ended with the yielding of the men; but the continued depression in business in England, and the consequently continued falling of prices, makes the cutting down of wages go on in one trade after another, and this the men bitterly resist at every turn. A reduction among the masons at Sheffield has brought on a general strike among them. A similar reduction among the journeymen carpenters has been announced, of which the result is not yet known. A general lowering of wages in all branches of the engineering and shipbuilding trades in Liverpool is expected, and will doubtless be contested also. But the chief struggle is preparing among the coal and iron trades. The mine-owners in South Yorkshire and the adjacent part of Derbyshire have given notice of a reduction of wages, which has been resisted by all the lodges of the miners' union. It is understood that the owners in West Yorkshire will follow the example of those in the south, and the men have already entered into an agreement with their fellows to unite in resisting the reduction in both districts. This, it is said, will at once throw from eighty to a hundred thousand hands out of work. At the same time the London association of the Iron Trades' Employers has given notice that they must henceforth insist on either an increase in the regular number of hours' work per week or a reduction in the pay of the men. The Amalgamated Society of Engineers has determined to resist the demands of the employers, and if the demand is not withdrawn a general strike is expected. The society is said to be the strongest trades-union in the kingdom, and to have a million and a quarter of dollars in its treasury. A strike by them would throw out forty thousand skilled workmen and a much larger number of unskilled hands.

It looks as if the battle so portended were likely to be one of the severest of the labor war. However it may end, it can hardly be other than disastrous. The iron trades in Great Britain are now in an exceptionally critical condition, owing to the successful competition of other countries, particularly of the United States, and the coal trades necessarily suffer with them. If the men succeed in the struggle in either trade, — or in both, for it is likely that they will succeed or fail together, — they will succeed in adding a heavy load to an industry that already shows symptoms of paralysis. If they fail, they will still have done by forced stoppage an injury to their employers of which they must themselves feel the burden; but they will waste a great part of their own strength in the conflict, for they will probably not give up early. The funds which they have laid up for the relief of the disabled among them, or of the families of those who die, will be eaten up very fast, and in spite of this the hardships which it was their purpose to avoid will have been increased. It might have been hoped that the fortune of the Oldham strikers, who, having in a few weeks spent more than a quarter of a million dollars in the effort to force their employers to pay them wages which the condition of business would not allow, found themselves obliged to yield, would have made other unions slow to follow their example. But there is not much hope of avoiding the waste and injury of strikes so long as workingmen are taught or allowed to look upon every diminution of wages as an oppression. Their greatest benefactor just now would be he who should teach them that no class in a community can expect to be exempt from the suffering and loss of a period of general adversity, and that to strive against such loss with violence is to kick against the pricks; and should moreover lead them to look for comfort in the doctrine that even a fall of wages does not necessarily mean a loss of comfort when the cost of living goes down with them.

A RETROSPECTIVE GLANCE AT SOME OF THE ARCHITECTURE AT THE FRENCH EXPOSITION.

II.

The façades serving as entrances to the portions of the Exposition assigned to the different nations, as well as the French buildings they face, are only seen when you get into one of the courts, or spaces left between the galleries of the temporary building of the Exposition. Indeed, as must always be the case with a gridiron plan, one gallery or row of buildings hides all behind it, so that in any general view, only the outside rows can be seen. In the case of the Exposition building too, outside of the outer rows of buildings or galleries, on the land side, stand a number of more or less neat temporary wooden sheds. These are used for a variety of purposes: ticket offices, Bath-chair stands, and so on. Close outside of these again is a high open picket fence. So that I cannot recollect ever seeing the temporary buildings of the Exposition at all, from the land side. But the river front is in full view from the Trocadéro, and from all along on the heights adjacent. The building, or buildings, so seen, struck me as very far from pleasing or fine. An attempt at architectural effect is made by raising domes at the corners of the façades and in the middle. On the whole I am not sure that they are not the most frightful things — though with a kind of harmless frightfulness — that I have ever seen. They are a most valuable lesson on the difference between what may look well on paper and what looks well when carried into execution, and also as to the difference which the material makes in the carrying out of a design. These domes are seemingly square on plan, and on each side of the square is carried up, in a semicircular gable, one of the four sides of the rather low square tower on which the dome rests. The bases of the gables and the base of the dome are on the same level, but the curve of the dome is such as to make it rise above the gables a little and show that a dome is intended. As the gables are glass, and the dome is covered with painted sheet iron, or what looks like it, and as you look straight through the gables and cannot see that there is anything there but air, or a few bars and some dirty glass, the domes, after four quarters are cut out by the gables, look heavy and clumsy, but yet supported on nothing in particular. As to shape and color they are like those pieces of wet sail-cloth that are sometimes seen pegged down over cocks of hay to keep the rain off. The middle dome has a variety of curves and turns and a considerable amount of painted adornments and gilding, besides its size, to distinguish it above its brethren at the corners. But, somehow, I think it is a greater failure than they are; it tries so much harder to produce some kind of an effect, while they are so contented with their ugliness, and unconscious of it, as to be rather respectable. These not very happy pieces of architectural design ought to be very happily designed indeed, to excuse their existence, for they are of no apparent use whatever, but are seemingly built only for beauty's sake, only for appearance, and to satisfy a sort of conventional notion of what would be proper. They have, however, a value as warnings, and show that where to the glass shed, of which the Sydenham Palace is so pretty an example, is added the opaque roof necessary in most climates, a problem is presented which has not been thoroughly thought out.

The principal galleries of the temporary exhibition building run at right angles to the river, and if we consider them as answering to the bars of a gridiron, then the long and more spacious gallery along the bank of the river, which connects the ends of the galleries at right angles to it together, and another similar gallery connecting the other ends of these galleries on the land side, may be compared to the end pieces of the gridiron which connect the bars together; and the bridge over the Seine thus answers to the handle of the gridiron in its position. Of this bridge, which is on a level with the terrace on which you come out from the temporary building, and on a level with the garden immediately on the other side of the river, one is, in crossing it, scarcely conscious. It is so broad, so adorned with flowering shrubs, that you may cross and recross it a dozen times without being aware that the Seine and a broad roadway along its bank are passing beneath you. This is all the more the case both because your attention is more or less distracted by the people about you, and because a happy art has succeeded in so combining what really lies on two sides of the river that you have no feeling that the thing is in two parts. It is still always one whole, and if you are recalled to the existence of the river, it seems a

charming addition to that whole. It does not injure, it helps, its oneness.

As you come out on the terrace, and cross the bridge, you find immediately facing you, and throned upon the heights, the Trocadéro building, — the building which is to remain the permanent record and monument of the Exposition. And out of the middle of the building leaps a river, falling first in one broad sheet over the face of a great dark archway behind it, and then leaping in cascades from one broad marble basin to another, coming full face down toward you, to be caught together, just opposite the end of the bridge you are crossing, in a great lake-like marble basin, begirt with colossal bronzes and statues in marble, while within the basin grow water lilies and other aquatic plants, and around the whole circles a broad belt of flowers of every imaginable hue. From each side of this central building, on the heights above, extend arm-like wings, something like the colonnades which enclose the piazza of St. Peter's at Rome. They are in plan a quarter circle. They are alike in design and are finished each with a sort of pavilion of very pleasing proportions. The central building, with these enclosing arms, thus forms a background and finish to the garden beneath them. The central building itself rounds out toward the garden like a vast apse; a continuous colonnade is carried around the garden side of this building and its arm-like wings. This colonnade makes a delightful promenade, with all Paris lying at your feet. Flights of steps lead down from its level, starting on each side of the central building, meeting in the middle lower down, and then dividing again. And so on, passing from terrace to terrace, they lead down, between lines of fountains and flowers, on each side of the tiers of cascades already spoken of. All this is beautifully planned. There is one level where the terraced way passes behind the "Nappe," as it is called, or sheet of water which forms the first waterfall. It is here that the large arch, already spoken of, shows behind the water, and by its semi-obscurity, in contrast with the flashing lights of the water falling over it, sets off the latter with great effect.

On each side of the garden, on lower levels than the central building and its wings, are clustered, in all sorts of picturesque ways, the Chinese pagodas, Japanese tea houses, Turkish, Moorish, Tunisian, Algerian, and other bazaars and pavilions. Some of these are very pretty. The Chinese building is enchanting at a little distance, and the interior of the Japanese cottage is a delicious bit for closer inspection. On the whole, there is such a motley lot of these buildings and they encroach so upon the garden in spite of an evident effort to keep them back, that they rather injure the general effect. But then these are temporary buildings to be cleared away when the Exposition is over; and the Exposition, while it lasts, lends them an interest which more than compensates for their injury to the general effect by their presence. Passing round by these you find again, amongst and behind them, all sorts of pretty gardening devices, for all of which places have been provided in the general plan, and which, therefore, form a part of the general architectural result and the pleasure which the architects have planned for you. There is rock-work which is artistic, not only because it is so natural looking as to deceive, but because it is really beautiful in itself. It is also on such a grand scale that you find yourself brought up against precipices, moss-overgrown and dripping here and there in the most natural manner. These precipices deftly mask the high bluffs of the Trocadéro, and mark the limits of the Exposition grounds in those directions. Or, again, you can descend into caves and wander through labyrinths which seem under the sea; and you can see the fish swimming about over your head or on either side of you. Invisible walls of plate glass divide you from the waters, and being inserted in openings in the rock-work in every direction around you, some being at a distance and seen through other openings, it is difficult to tell when the water is near and when far from you, and you seem to be walking through the water itself, as in a dream, or as in one of Jules Verne's fanciful stories. These pleasant fancies put you in good humor and dispose you to be pleased with the more serious architecture to which they form an adjunct. You can go around by these features of the grounds and by little ponds with islands and boats, and through rustic vine-clad arbors, and actually up a ravine, all made, and all made in a few weeks, but which it is difficult to believe not the handy-work of nature. Or you can pass by winding walks through lines of laurels and flowering shrubs. Or you can mount by the easy and beautifully managed flights of steps which lead up through the middle of the garden. So, by a variety of ways you can reach the encircling arcades, whence you can look back on all you have passed through, and on the magnificent prospect beyond, and count the domes and towers and splendid monuments rising from every part of a great and beautiful city which has aimed to add, in the permanent building of the Exposition, another to her many noble monuments. From the level of these arcades you enter the principal floor of the permanent building. Arrived here you can visit the building, which contains a large hall or theatre for official ceremonies, assemblies, concerts, etc., and long galleries for the display of sculptures, pictures, and other works of art and trophies of industry, to which it may be desired to give a permanent place after the Exposition is over. After visiting the building, if you do not care to return as you came, you can pass directly through it, threading a wide marble-paved, many-columned vestibule, and so out on the Trocadéro side, leaving the building and the Exposition behind you, and by a *détour* find your back to Paris. Or, of course, if you prefer, you can visit the Exposition in the reverse order. You can go to the Trocadéro and enter by the grand entrance to the permanent building in its west front, which faces away from Paris. If you enter in this way, as the spacious and handsome vestibule forms the whole lower story of this part of the building, you can pass directly through it, and on coming out on the galleries or open colonnades, carried along the garden side of the building and its projecting wings, you at once have spread out below you the view just spoken of, of the Exposition grounds, the other Exposition buildings, and, beyond, the city of Paris, stretching in every direction. It is a magnificent *coup d'œil!* It will at once be seen that the site and the use that has been made of it, the architectural plan, in short, affords a choice of the two kinds of pleasure. You can pass from the particular to the general, or from the general to the particular. You can have the *coup d'œil* last or first. All this has evidently been studied, all these effects thought of, and it seems to me that the plan is worthy of the site; and that, as far as plan goes — and that is very far — the architects are deserving of the very highest praise.

AN ATTEMPTED RESTORATION OF A HYPÆTHRAL TEMPLE.

[We translate from the *Encyclopédie d'Architecture* the following memoir read at the Académie des Inscriptions et Belles-Lettres, December 28, 1877.]

I.

WHEN we attentively examine the plan, section, and elevation of most of the peripteral temples, what we at once notice is the striking unity with which the different parts were put together. Not the slightest break nor the least constructional sign leads one to imagine that these buildings could ever have been other than rectangular naves whose roofs must have been continuous.

The mere consideration of the importance of the temples in the Greek cities, of the forethought that chose for them positions which brought them at once into full view, so that the whole length of the roof was visible, is enough to set aside once for all the hypothesis of a gap in the roof, whose effect would have been to interrupt the harmony of the lines of the temple, and to produce a broken sky-line, apparently indicating the joining together of several buildings.

Upon this point antique representations justify our position. Numerous bas-reliefs (of somewhat late date, it is true) show temples whose roofs are unbroken. Various medals give us information which is no less precise. Thus, an Athenian bronze of the imperial epoch represents the Parthenon covered with an entirely unbroken roof. These reasons are enough to limit the means of lighting which we wish to establish to this first condition of preserving without interruption the continuity of the lines of the temple roof.

If we enter the temple we notice at once in the background of the cella the chryselephantine statue of the god. This colossus is composed of all kinds of precious material, a multitude of small pieces joined with infinite art. Certain precautions which writers have made known to us are necessary to ensure its preservation. To prevent its swelling or shrinking it must be withdrawn from the too direct action of atmospheric influences. A ray of sunlight, a few drops of rain, would soon make it come to pieces.

Before the statue of the god are gathered works of art; pictures, statues, furniture, hangings, utensils of gold or silver, encumber the central aisle of the temple. The visitor can hardly find passage among these accumulated riches. There, too, the sun and the rain would do irreparable damage if one were awkward enough to give them access to the cella. There is then no doubt that the openings which admit light should be so arranged that the objects stored in the temple should be sheltered from sunlight and rainfall. Do we not know, moreover, that the part of these edifices where the public treasure was sometimes kept was habitable? Plutarch informs us of this curious fact by showing to us Demetrius Poliorcetes lodging his courtesans in the opisthodomus of the Parthenon.

To the restrictions imposed by material exigencies are to be added the conditions which artistic necessity dictates. The central part of the temple, completely surrounded by columns, is in shadow [See Illustrations]. Now on festival days the crowd saw the statue of the god through the open door of the cella. Is it possible that their eyes, prepared for the greatness of the spectacle by the cleverly managed transition from the outside light to the half light of the porticos, should find beyond the pronaos only this same dazzling out-door light? We do not believe it. We shall misconceive the genius of the Greek architects if we do not see that the veil of shadow spread between the god and his adorers should be the preparation for an illumination in some soft artificial, which should oppose the softness and richness of its effects to the crudity and violence of the external light. Such seem to us to be the complex conditions, apparently contradictory, which must be met by whatever method of roofing and of lighting is accepted for the hypæthral temple.

It remains now to indicate the means which can lead to the realization of the programme which we have just traced. For that, we must experiment upon a building whose dimensions, dispositions, and construction are exactly known. The little temple of Ægina, several times carefully drawn and measured, will most conveniently lend itself to the reconstruction that we shall attempt. Let it be remarked, however, that we had not intended to present in the drawings attached to this memoir a purely archæological restoration

of this temple;[1] while reproducing with exactness the construction of the building, we have used a relative liberty in the details of its ornamentation, wherever the lack of documents has left us a gap to bridge. For a long time it was supposed that the temple of Ægina was that of Jupiter Panhellenius, which Herodotus mentions; it is almost proved to-day that this monument was consecrated to Pallas Athene. We have, nevertheless, chosen the first of these suppositions for the reason that a colossal statue seated upon a throne gives to the general aspect of the cella an amplitude that an Athene upright could not produce. These explanations given, we come to the root of our subject.

A detailed examination of the fundamental arrangements of the temple of Ægina, the reading of the plan, to speak as an architect, clearly indicates the function of all parts of the building, except that of the two rows of columns dividing the cella. What was the object of these supports? M. Beulé answers that they diminished the bearing of the roof; this explanation seems reasonable where a large building is in question; but at Ægina, a length of three metres is sufficient to give the rafters a support upon the walls of the cella. Would a double row of columns be employed to unnecessarily diminish so short a bearing? The study of the cross-section of the temple adds still more to the difficulties of this question. The superimposed colonnades of the cella are shown separated by a ceiling, so that the upper colonnade forms a gallery, a kind of walk, offering some analogy with the triforium of Gothic churches. Now — most singular circumstance — in certain temples, those of Ægina and the Parthenon, for example, there is no staircase giving access to the galleries.[2] They were not then for public convenience; on the other hand, we cannot assume that the architects raised them without motive, or for the sole purpose of adorning the cella. The Greeks did not thus understand architecture; for them, to decorate a building was to cover the constructive parts with a studied enrichment which clearly indicated the special destination of each of these parts. As for us, we do not hesitate to affirm that the rows of columns in the cella answered an imperative necessity; this, we scarcely need say, was the necessity of lighting the temple. We shall proceed to prove that all the provisions for covering and lighting determined by us are exactly fulfilled by means of the double colonnade of the cella.

Let us suppose a continuous roof upon the temple; the cella is then in complete darkness. If we remove a row of the wide marble tiles[3] from each of the roof surfaces lying between the interior columns and the walls of the cella, — disregarding for the moment the flow of the water upon the rest of the roof, — the light, falling first perpendicularly upon the horizontal partitions, or ceilings, which cover the lower colonnades, is spread, as if by so many windows, through the intercolumniations of the upper gallery, into the cella. The light with which it irradiates the divine statue and the treasures at its feet is a mild, lightly diffused cross-light, sifted through the columns of the high galleries. It is, moreover, of constant uniformity, for vertical partitions, purposely contrived, and of suitable height, prevent any direct sunlight from ever penetrating to the cella itself. This arrangement is, from a certain point of view, the same as that in our mediæval cathedrals; it is something religiously mysterious. The outer glare is so softened that the observer, looking through the open door of the temple, never dreams of seeking the means by which it has been effected.

The temple is now lighted in accordance with our views; but the rain, which we have reason to fear, finds free passage through the opening just made in the roof. The arrangement of the colonnades removes all danger in this direction. In the first place, the narrowness of the openings opposes an obstacle to the entrance of the rain; secondly, the partitions which intercept the sun's rays induce the rain to beat vertically down upon the stone ceilings separating the galleries. Finally, a slight inclination given to the upper surfaces of these ceilings is sufficient to conduct the water, through little openings in the walls, out under the porticos. By these simple arrangements, not a drop of water can fall upon the objects collected within the temple. It is not even necessary to cut holes in the walls of the building to effect this result; the small quantity of water falling upon the stone ceilings, suitably hollowed to receive it, can stay there until evaporated. Where the ceilings are suppressed the rain may be allowed to fall upon the pavement of the lower gallery. The flagging of the great temple of Pæstum, which is depressed between the walls and the columns of the cella, is in accordance with this hypothesis.

Let us now indicate the readiest method of draining that part of the roof which is between the light-openings. It is sufficient, merely to turn up the ends of the tiles surrounding each opening, to flange them (hollowing the marble), and then to fit them carefully. Upper and lower gutters are thus formed; the first conduct the water to right and left of the openings as far as the first continuous row of tiles, whence it escapes over the eaves; the latter prevent the wind from blowing the rain back into these apertures. It is not without interest to remark that the construction and arrangement of these gutters are taken from the temple itself. They are an exact reproduction of the hollowed moulding which caps the pediment.

If we are not mistaken, the temple thus completed is, as M. Beulé would have it, "completely closed and lighted." The statue of the god receives the desired light that the shadow of the outer porticos calls for, and is at the same time shielded from the inclemencies of the weather. Remark, that to attain these results, the introduction of no new element into our building has been necessitated.

All changes have been limited to the modification of a few tiles, and others of the same kind have been found upon most of the pediments of temples; it would be almost impossible to recognize, among heaps of ruins, fragments that might with certainty be attributed to the gutters of the roof openings. It may be remarked, too, that the narrowness of these openings, in the given example, is owing to the small dimensions of the temple at Ægina. Notwithstanding this restricted appearance, the total light-area exceeds ten square metres, which is more than sufficient for so small an interior as the cella at Ægina. In the Parthenon, these openings would have measured more than one hundred and fifty square metres. There is little necessity for insisting upon these questions of detail; we have yet to consider the outside of the building.

Let us place ourselves on a level with the temple and choose a position which permits us to see the roof under a certain angle. Its continuity is unbroken; two horizontal lines, barely perceptible, are traced upon it without producing any disfigurement. Now, turning aside, we observe upon the plain above us other temples whose marble roofs gleam in the sunlight; we see these roofs marked by two slight black lines; no alteration results therefrom; in both cases, the unity of the temple is respected.

[1] For this, we refer to M. Ch Garnier's beautiful restoration.

[2] The staircases were used solely for the inspection of the roof. This is the opinion of M. H. Zabrouste, *Restauration des temples de la ville de Pæstum*, p. 80

[3] The width of the marble tiles from the Temple of Ægina, found by Blouet, exactly coincides with the width of the interior galleries.

THE ILLUSTRATIONS.

THE NEW YORK BARGE OFFICE. MR. JAMES G. HILL, SUPERVISING ARCHITECT.

THIS building, containing offices and waiting-rooms, will face the Battery, with a frontage of about 116 feet and a depth of 50 feet, and is to be built of brick and stone. The shed portion, for the examination of passengers' baggage, will occupy nearly the whole of the pier, and will be built of iron and glass. Its dimensions are to be about 170 by 185 feet, and it will form a single room with a gallery extending around the sides.

ST. JAMES'S CHURCH, NEW BEDFORD, MASS. MR. W. C. BROCKLESBY, ARCHITECT.

This church, now nearly completed, is built of brick, with finish of Longmeadow stone. It is furnished with some excellent stained glass memorial windows by MacDonald, of Boston. The cost is between seven and eight thousand dollars.

RESTORATION OF AN HYPÆTHRAL TEMPLE, BY M. CHARLES CHIPIEZ, ARCHITECT.

This view of a restored Greek temple (the temple at Ægina) is taken from the *Encyclopédie d'Architecture*, and is the principal illustration to the interesting article from the same journal of which we give the translation above.

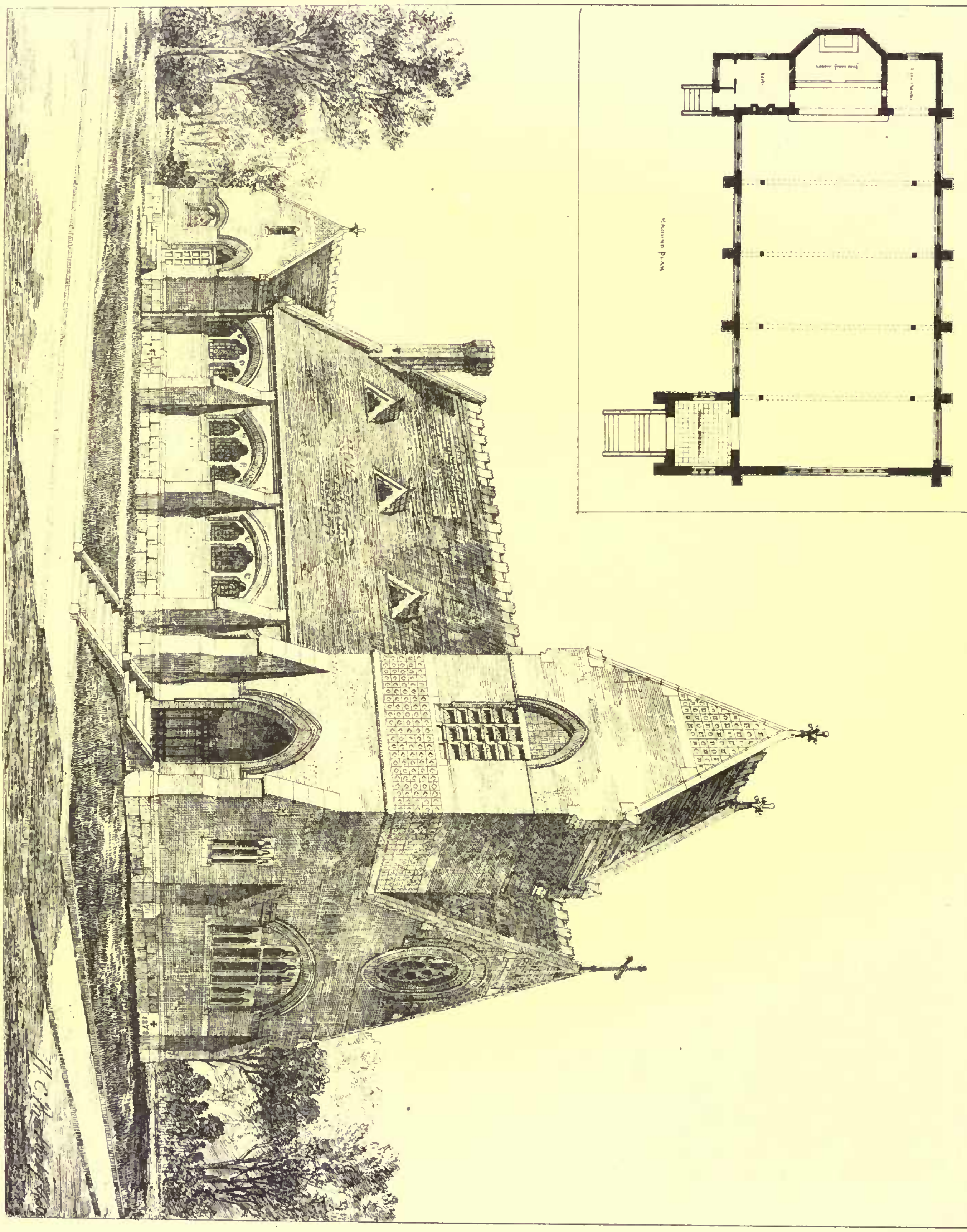
CORRESPONDENCE.

NEW YORK.

WE see every week in the New York papers that the Department of Buildings has issued permits for a large number of new buildings, and yet, anomalous as it may seem, there is hardly any architectural work doing in the city. There are a few examples, but they can be counted upon one's fingers, and even then one is obliged to stretch to their utmost limits such terms as planning and designing, that they may even seem to apply to some of the piles of stone or brick that obtrude their unreasoning and unreasonable masses upon our sight. The New York real estate owners are keen enough to know that they can in all probability build more cheaply, and probably too get money more cheaply for building, than they will be able to do again in many years; the city is therefore studded with new stores, resplendent in cast-iron fronts of the newest and most approved design, and with speculative dwellings in blocks and rows, of the stereotyped pattern, with all the well-known inconveniences, narrow halls, stepladder stairs, dark rooms, and chaste and neat decoration, etc., not to speak of perfections in the art of plumbing and gas-fitting, with all of which the New Yorker has long been familiar.

A great many apartment houses, so-called, have been built within the last few years. Unfortunately most of them have only the conveniences of middle-class tenements, and are built on the principle that four rooms, six feet square each are more desirable than one room twelve feet square, and that since the odor of dinner is naturally going to pervade the whole apartment, there is no use attempting to avoid it. Sunlight also is considered a mere luxury in most of the rooms, and even direct light and air are treated as being of very little importance, as compared with the advantage of advertising nine rooms instead of eight. Many of these so-called apartment houses, on the other hand, are really hotels, with no possibility of having a kitchen, which has always seemed to me to be one of the essentials of a home.

It does not seem improbable that, thanks to bad planning and de-



ST JAMES CHURCH NEW BEDFORD MASS.

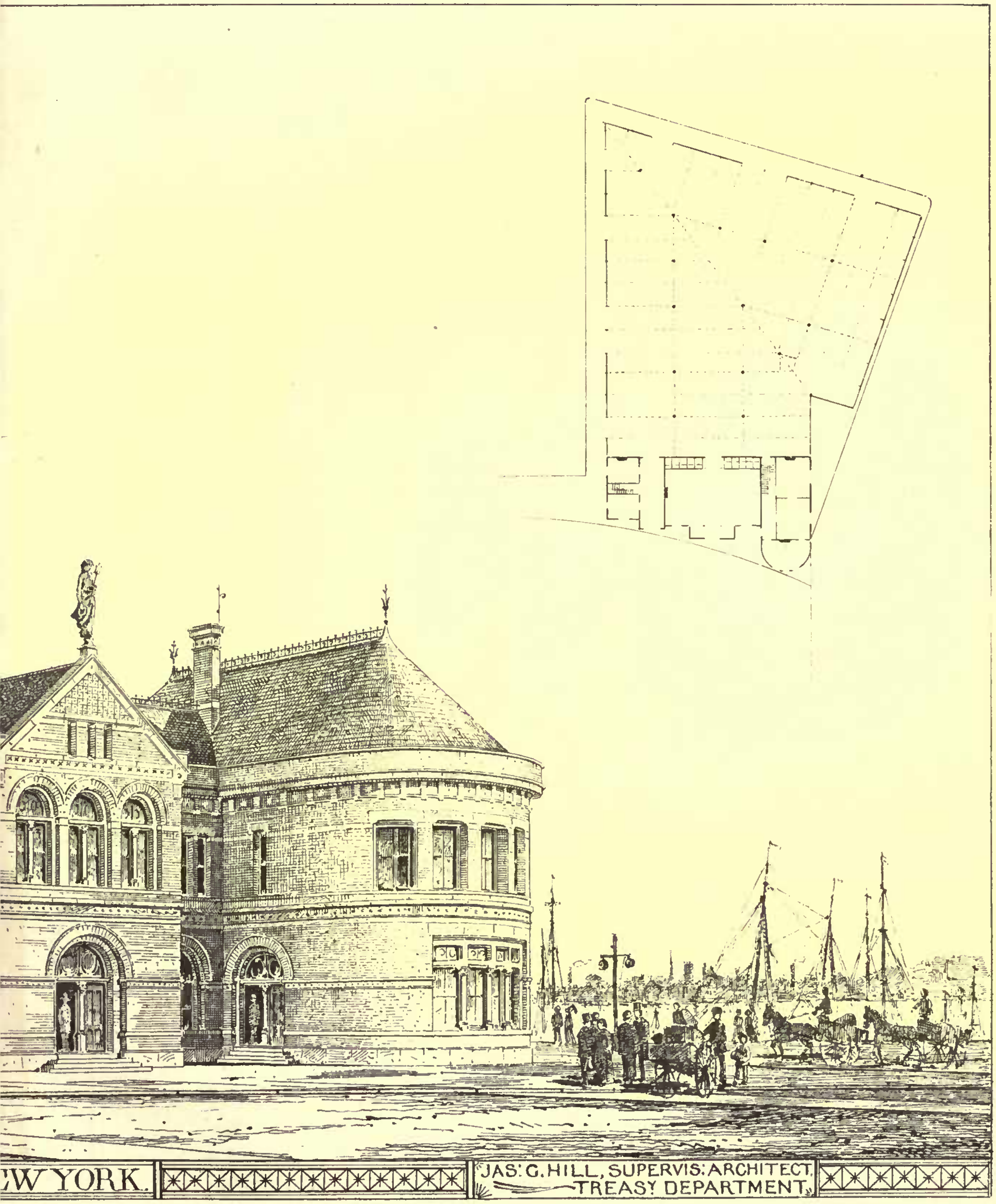
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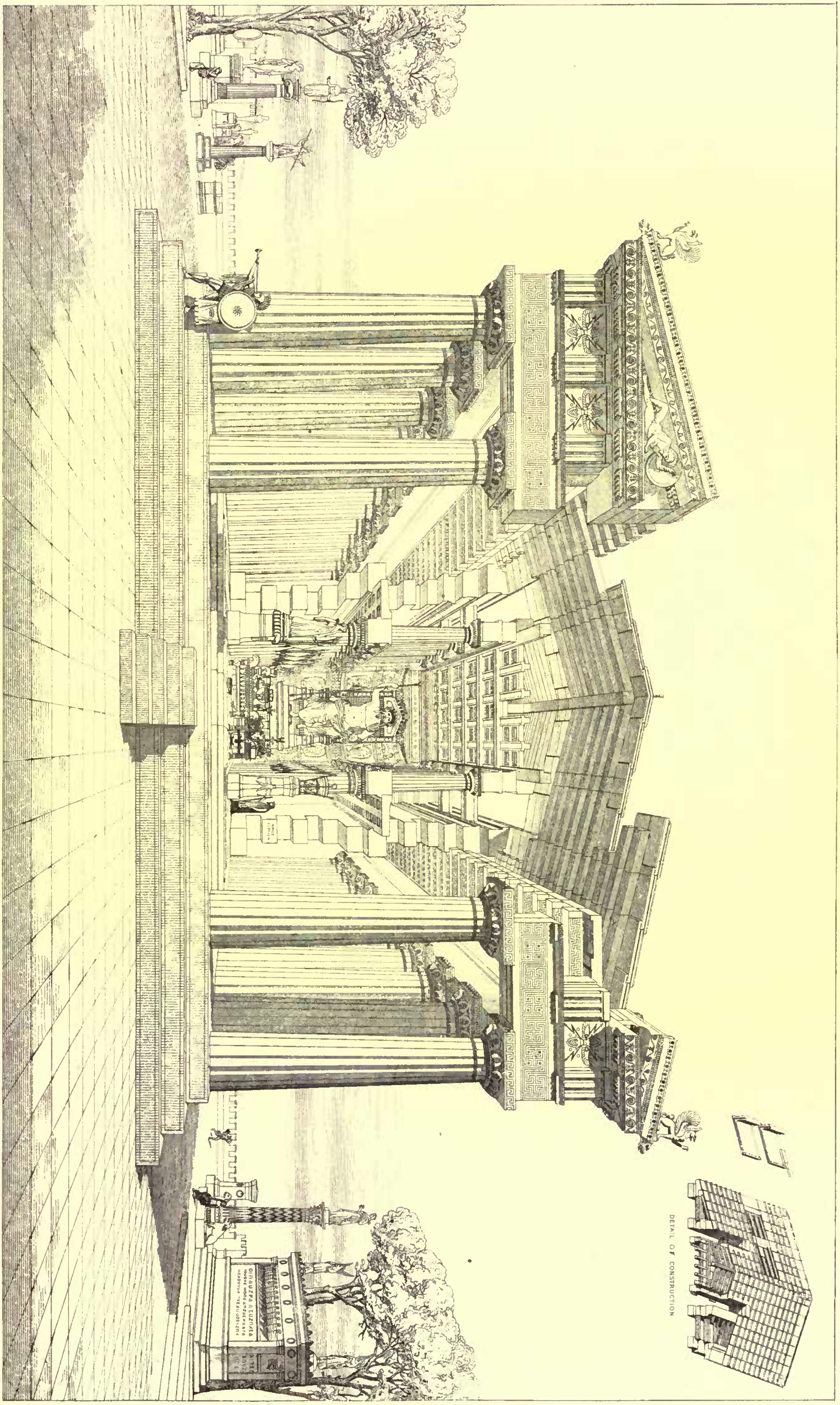
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RESTORATION OF A HYPÂETHRAL TEMPLE.

M. CHARLES CHIPIEZ ARCH'T.

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

fective arrangements of light and ventilation, a great number of these houses will sooner or later become utterly useless for the class of tenants for whom they were intended, and either will have to be rebuilt or lapse into commoner uses with necessarily much lower rents. That there is a demand for apartments is shown by the high rents paid for desirable ones, and even for undesirable; and that the conveniences of a good apartment greatly outnumber the advantages of a house for many people, we leave to those who have spent any length of time on the Continent. It is, therefore, high time for the reputable architects to take firm ground upon the question, and to point out to their clients, when consulted, the necessity and the ultimate advantage of giving up more space to attractive courts if possible, if not, to less attractive but essential wells and shafts; also to the advantages of a good exposure to the sun and wind, nowhere more essential than in this country, and nowhere so persistently disregarded.

The disposition of our streets and avenues makes the planning of an apartment house extremely difficult; but the real difficulty lies in the feeling of owners that an architect is very well for the embellishment, but is not necessary for the planning, of a building. No one does the profession greater harm than he who by his work encourages this erroneous idea. The most perfectly developed school of architecture, the École des Beaux-Arts, of Paris, insists persistently and constantly, in all the awards given to students' work, that a good plan, even with poor elevations, may be worthy of a reward, whilst elevations, no matter how skilful, can never make up for the vital defect of a poor plan. This may sound digressive, but it seems to us of vital importance to the profession, that established architects should not only prove this by their practice, but should cry it from the house-tops and insist constantly upon it for the benefit of the younger members and of those about to take up the study of architecture. The first requisite for good architectural work is the construction, the next the plan, and only third the purely artistic qualities.

Taking such buildings, at present going up, as seem to call for special notice, and starting from the lower part of the city and working our way up-town, so that we may be entirely absolved from any charge of partiality, we have, first, the Boreel Building, of which Mr. Hatch is the architect; it is on the block opposite the Equitable Building, and bounded on its principal sides by Broadway and Cedar Street. The plan seems to be an excellent one in general distribution, though the chance to make the large glass-covered court which occupies the centre of the building, and on which many of the offices open, an ornamental and attractive feature, seems to have been sacrificed to the desire to get a few more offices, which are, after all, but inside staterooms, depending for light and air upon the court. The qualities of the exterior are, however, extremely negative, the effect of the building is not as bad as it might be, and having said that we cannot in conscience say more.

The next building on our way up-town is the Morse Building, corner of Nassau and Beckman streets. It is the work of Silliman and Farnsworth, and shows evidence throughout of intelligent and careful study. The plan is practical and straightforward, and though a more spacious treatment of halls and stairways would seem justifiable, it cannot be said to be necessary. The architects had the difficult problem to solve, in designing the exterior, of a large, many-storied building, placed on the corner of two relatively narrow streets, and it seems questionable whether they have been altogether successful. The building is of brick and terra cotta, red and black brick, moulded brick, and terra cotta sills and string courses being used. The openings of the basement are spanned by segmental arches, with a very successful use of moulded and colored brick, and the deep reveals give an effect of great strength and quietness; in the next and main story the openings are round-arched, large, and well proportioned, and the main entrance runs through these two stories. So far the effect produced is excellent, and shows perhaps the best use of brick of any work in the city, and is certainly a very creditable composition, both in its proportions and in its color; above this, however, the design seems to hesitate between two different modes of treatment, not accepting either mode frankly enough to be successful; this upper part consists of six or more stories, through which the eye is led by an uneasy succession of round and segmental-arched windows to a cornice that seems insufficient for the mass below it. There are piers between the groups of windows, but they are not of sufficient projection to catch the eye, and, moreover, every band of color or decoration runs through them uninterrupted. It would, it seems to us, have been more effective to have held firmly to the mode of construction indicated here, and carried out in several similar buildings with excellent effect; to have made the piers bolder and more solid, and treated the walls between merely as screens against the elements, in which the windows could have been grouped as use and taste dictated, the whole then crowned by a cornice proportioned to the piers that carried it. The effect of the building is excellent, however, and the construction seems to have been carefully studied and well carried out; it certainly is a relief to find work challenging criticism by its good points rather than by its bad ones.

Another large building is the Florence apartment house, corner of Fourth Avenue and 18th Street. Mr. Grewe is the architect. It seems to have many of the defects that distinguish buildings of its class in the city, but has the advantage of a southern exposure. Its great fault is the abundance of long passages, the rooms themselves being well lighted and aired. Of the exterior, from an artistic point of view, the less said the better.

There are several alterations of dwellings into stores, especially one by Mr. Basset Jones on 14th Street, and another by Mr. Harney on Fifth Avenue near 30th Street, that show a temperate and pleasing use of what one may call either Queen Anne, Jacobean, or Georgian, with equal reason: examples of "*lucus a non lucendo*," in any case.

Of the private houses that offer points of interest are: a house for Mr. Bronson, on the northwest corner of Madison Avenue and 32d Street, in which Mr. Hunt makes his reappearance upon the field, with work we should hardly know as his, it is so much more quiet and sober than that to which he has accustomed us in the past. The construction has not yet progressed far enough to enable one to judge of its merits, but it promises to be particularly good. Another house on 34th Street, near Park Avenue, for Mr. Dickerson, by McKim, Mead, and Bigelow, shows careful study, and introduces moulded and carved brick, with Pennsylvania bluestone for the lower stories, and for sills, bands, etc., above. The arrangements for heating and ventilating, the entire plumbing work, and the construction of the floors, which are of iron and hollow brick, were made by Mr. Dickerson, and carried out under his superintendence, and would be well worth a special letter.

Mr. Post's design for a house for Mr. Brahm, which is being carried out on 36th Street, between Madison and Fifth avenues, introduces terra cotta together with the brick and bluestone employed. With all respect to Mr. Post, the terra cotta panels would be more in scale were they placed on top of the Western Union Telegraph Building. He has so much really good work standing in New York that we do not fear to call attention to this fact.

On Madison Avenue, between 40th and 41st streets, is a house by Mr. Harney. It has a slightly bowed front and round-arched entrance door, with a keystone supporting a thin shelf that serves as balcony to the window above; it covers an ordinary twenty-five foot lot, and is built of brick with brown stone trimmings. The detail partakes of the character of our own colonial work, with reminiscences here and there of Norman Shaw and the English Queen Anne men. Although there is no great originality in the treatment or conception, perhaps *because* there is not, we do not hesitate to say that it strikes us as one of the best solutions of the "street architecture" problem we have seen in modern American work. It is carefully studied and temperate. B. W.

MR. STORY ON THE WASHINGTON MONUMENT.

[A letter to Mr. W. W. Corcoran.]

I sent on to Mr. Senator Morrill, some three months ago, a large drawing of a design for the Washington Monument, which I asked him to do me the favor to show to you, and which, I dare say, by this time you may have seen. It was made, as you are probably aware, at the express request of the Committees of the two Houses on Public Buildings, of which Senator Morrill is the chairman. I feel sure that you, who are so interested in art, and endowed not only with large generosity, but eminent good taste, must feel, with the whole world of artists and architects, that the completion of the monument according to its present design could result in nothing else than failure to satisfy any canon of good taste and beauty or appropriateness. I hope you will pardon me in appealing to you to exert your influence to prevent the carrying out of a work which will be exceedingly expensive, and which, when completed, can claim to be nothing more than the tallest chimney in the world, and, perhaps, the ugliest; which has nothing American in its character, nothing indicating it to be a monument to Washington, and nothing either original or beautiful or characteristic in its design.

I am well aware that some of the members of the Washington Monument Association considered themselves pledged, by the circumstances of the case, to carry out the original design, and, though desirous to alter it so as to conform to a better taste, deem that they are not at liberty to do this. But, after all, the design has been changed, and changed in so many and material particulars, that it has been robbed of all that was peculiarly characteristic. In the first place, the Grecian colonnade, with which it was to be surrounded at first, if I do not mistake, has been rejected, and, in the next place, its height has been greatly diminished. Now, if there were any two points which were essential and characteristic in the original design, they were precisely these which are now rejected; and, if it be in the power of the association to introduce such alterations, it is difficult to see why they may not make any other changes that seem desirable. An obelisk, rising out of a Grecian colonnade, is evidently the greatest architectural anomaly and absurdity that ever was imagined; but it was none the less an essential feature of the original design; and, if the original design must be carried out, this colonnade cannot be omitted. An obelisk has in itself but little to recommend it, even in its best form. It is essentially Egyptian, and properly was always a monolith, adorned by deeply cut hieroglyphics to break its monotony. But an obelisk built up of blocks of flat separate stones, without hieroglyphics and incised characters, and carried to a great height, becomes simply a chimney, and loses all that was characteristic of the true Egyptian obelisk. This form of monument is the refuge of incompetency in architecture. When

an architect has no ideas, he resorts to the obelisk. When a builder has no knowledge of the art, he makes an obelisk, just as a person who cannot sign his name makes a cross. An obelisk of this kind is, in a certain sense, simple, but it is also mean and ugly in effect, and has nothing to say. What has an obelisk to do with Washington? How does it illustrate his character and services, his personality or history, or the events and persons and country with which he is associated? Why, then, should we continue, at a great expense, to carry on to completion a design which has nothing to recommend it, and which, when completed, will be nothing but an offense and an eye-sore? Would it not be far better to erect a work that shall be a delight to the eye, and have appropriateness as well as beauty?

In making the design which I have forwarded to Mr. Morrill, I have founded it upon the existing fabric, having understood that, under the circumstances, it would be worse than useless to make a design which did not take into account and utilize what had already been done. The monument, as it stands, I took as the core of my structure, encasing it with the colored marbles, in which America is so rich, and changing its character into a tower with a portico at its base. In front of this porch, or rather enniched beneath it, I placed a colossal statue of Washington within reach of the eye, so that it could be seen in all its details as the commanding feature of the front. On the opposite side, I proposed a statue of Liberty, — achieved by Washington for our country, — and on the two sides, two great bronze doors figured over with the principal events of the Revolution, and the portraits of the distinguished men of the period, the coadjutors of Washington. Fame on the top of the tower in gilt bronze, — the spiritual essence of his life, — he himself at the base, the corporeal presence.

This design would necessitate no destruction of what has been done; all would be decorated and beautified in effect, and make a striking feature in the city, commanding a view far down the country.

As for the details, they might be changed and varied from the drawing, but I am persuaded that there is no other method of preserving what has been built and making of it a beautiful structure, than the adoption of some such scheme as that I now propose. As for the cost, I scarcely think it would be much more than that involved in carrying the plain obelisk to the proposed height. After that has risen to three hundred feet, the expense of carrying it higher would greatly multiply in ratio of its height, and a very large sum would be expended to little or no purpose. But what should it matter, to a great country so enormously rich as ours, what the cost should be? We have, as yet, raised no monument justly to celebrate our great leader. No other country exists in which so little honor in this way has been paid to her greatest and most illustrious man. Think of England, in these late days, with her splendid monuments to Prince Albert? Think of France with her noble and costly monuments to Napoleon; the Arc de Triomphe; the Column of the Place Vendome and the Cenotaph. Think of Germany and her Walhalla, and her colossal Bavaria, etc. Florence, poor as she is, is now casing all the façade of her Duomo with splendid marbles, and everywhere erecting noble monuments to her great men. And is it possible that we can be content with a plain chimney to celebrate Washington?

There is not a manufacturing town in France or England, the chimneys of whose factories are not richer in effect. Ours will have no superiority over them, save that it will be balder and taller.

I hope you will excuse me in saying all this. It is not to urge my claims — far from it. I ask nothing for myself; I only wish my country to have a monument to which it can point with pride as worthy of the great man it celebrates, and of the good taste and generous liberality of a great people. No matter who makes this monument, so long as it is one of which we need not be ashamed.

THE AMERICAN INSTITUTE OF ARCHITECTS.

BOSTON CHAPTER.

THE regular monthly meeting of this chapter was held on Friday, January 3. Mr. Cummings, in the absence of the President and Vice-president, was called to the chair.

Mr. F. R. Allen was elected a junior member.

The Secretary then, according to programme, proceeded to give an account of Mr. Joseph T. Clarke's preliminary studies in London and Munich, as obtained from his letters, preparatory to proceeding down the Danube in the early spring, to prosecute his explorations among the Doric remains in Asia Minor, the Greek Archipelago, and the Greek colonies. Some discussion followed upon the nature and scope of Mr. Clarke's studies, after which the society proceeded to consider the special subject appointed for the evening, namely: —

"American Architecture, with Precedent and without." The Secretary read to the meeting the leading article in the *American Architect and Building News* of October, 1876, which formed the basis of the discussion.

The meeting agreed with the writer that a more thorough system of training and education was needed by the profession in this country, before it could make the most judicious use of the boundless mass of precedent at our control.

Mr. Van Brunt considered that this training could be best obtained by a much more thorough and scientific study of the classic orders, as affording a more exact discipline than is furnished by any other styles. He argued that this experience would, apparently, not only enable the student to design more grammatically in all other styles, but would instil into his mind a due respect for the past. From this sort of discipline, he thought, would result a greater reserve and modesty in the use of precedent, and a habit of self-denial in designing, — qualities essentially needed to correct our present lawlessness and our characteristic looseness in the use of *motifs*. He referred, with approval, to Mr. Longfellow's statement, that such academic discipline as is obtained in Paris confers upon students who have been subjected to it certain specific advantages when they practise in the broader fields of labor presented in this country. The main corrective is *discipline*, however obtained, and to the general mind, according to experience, the classic forms seem to afford the best schools, notwithstanding the opposition of so high an authority as M. Viollet-le-Duc, who argued from local premises and was naturally controlled by local conditions.

Mr. Cummings, on the other hand, thought that the result of such training, as exhibited in the architectural aspects of the streets of Paris, although showing everywhere details of great refinement or interest, was on the whole to him monotonous and uninspiring. Correctness degenerates into formality; the architect works in a strait-jacket which cramps him none the less for being voluntarily worn; the consequence is that to uniformity of material and uniformity of height is joined uniformity of style and uniformity of treatment, until all vivacity and variety are not only lost but actively despised as improper. Under this cold tyranny Paris, twenty years ago one of the most picturesque of cities, is rapidly becoming, in spite of its splendor, the dullest of European capitals, as far as architecture is concerned.

Mr. Peabody, in reply, stated that the monotony of the streets of Paris was attributable rather to the strict building laws than to any absence of freedom or enterprise in design on the part of the architects; that, in fact, the best professional talent was not often employed directly on these façades, but that they were built under the responsibility of contractors who were kept by tradition and by the prevalence of good style from the commission of such solecisms as are common in our own vernacular style. He pointed to the Palace of Justice, to the Library of St. Genevieve, to the Louvre, and to M. Vaudremer's church, as showing the best fruits of high training according to the French schools, and as examples of excellence and artistic feeling unattainable in any other sort of atmosphere. The English masters, Burges, Street, Waterhouse, etc., were great in spite of and not because of the absence of such an atmosphere in England. Their works, in the Paris ateliers, were considered "fine, but not architecture." They were all draughtsmen and artists by nature and practice. It was his opinion that our most effective and most available refuge from illiterateness, license, and vulgarity must consist in the cultivation of artistic instincts obtained by the constant habit of drawing and sketching, thus educating the mind and hand at the same time, making the eye more sensitive to the value of forms and more fastidious in choice of precedents. This habit he endeavored to encourage in his own office by every means in his power.

Mr. Cummings was far from disagreeing with Mr. Peabody concerning the value of the strict training which is enforced among the French architects; their mistake was in teaching that this training is the whole of architecture, and that the architect who steps outside the classic dead-line is a lost soul. Viollet-le-Duc, who has condemned this ridiculous bigotry with admirable spirit and force, is himself the best example of what a French architect can do, who having once loyally submitted to this training declines to make himself the slave of it. On the other hand, Mr. Peabody has cited in the Montrouge Church an admirable example of a brilliant architect working in the classic strait-jacket to produce a Romanesque church after the manner of the schools; the result is exquisite refinement of detail, — weeks spent, as Mr. Peabody says, on a baluster, and months, I dare say, on a capital, and a church which is ugly in spite of it, and which makes but a poor figure in comparison with churches now building all over England, to say nothing of our own country, by men whom we should perhaps all agree in pronouncing inferior in training to M. Vaudremer.

After some further discussion of the subject, the meeting adjourned.

THE BIBLIOGRAPHY OF RUSKIN.[1]

PERSONS who have followed Mr. Ruskin's literary career, as almost all cultivated persons have with more or less attention, will find it interesting, if they meet with this little pamphlet, to see how early that career began and through what varied paths of preparation he came to it, and will see with new wonder the range of his later activity. To his admirers and students the book will be a valuable aid in tracing out his surprisingly numerous writings. It has been written, evidently as a labor of love, by the Rev. Richard Herne Shepherd; and the labor cannot have been small, since, as the compiler assures us, every entry in it has been made with the

[1] *The Bibliography of Ruskin:* A Bibliographical List, arranged in Chronological Order, of the Published Writings in Prose and Verse of John Ruskin, M. A. From 1834 to the present time (October, 1878).

book or periodical to which it refers before him. That it is trustworthy we may infer, and we have the assurance of a letter from Mr. Ruskin to the compiler that he has found nothing in it to correct.

Mr. Ruskin's literary work began early, when he was but fifteen or sixteen years old. His first recorded publications are some papers printed in Loudon's *Magazine of Natural History*, in 1834. These are curiously in keeping with, and yet apparently remote from, the course of his after-work, showing from the beginning the tendency to the study of natural phenomena which has so strongly colored his later works. There is a paper on the causes of the color of the water of the Rhine, and one on the strata of Mont Blanc. People who do not know of him as the Oxford prize poet, or as the author of a volume of poems, will easily believe that he must have written verses; and we find, side by side with his early essays, a series of poems published from time to time in "Friendship's Offering," and other annuals. After he was fairly launched in his serious work he seems to have given up writing verses, and, with a volume of them collected and privately printed in 1850, the record of them comes to an end. Among his very earliest writings, in 1836, we find one which shows his architectural bent, a paper on the Cathedral of Basle, and in 1837 he contributed to Loudon's *Architectural Magazine* a series of essays on the poetry of architecture, which, he says in a passage quoted by his bibliographer, "contain sentences nearly as well put together as any I have done since." It was in 1843 that the first volume of "Modern Painters" appeared, and lifted him at once into fame. Since then his literary activity has been unceasing, and the range of his work, as we see it summed up in Mr. Shepherd's pamphlet, may well be astonishing even to those who have watched its progress. Painting, architecture, sculpture, engraving, geology, botany, natural history, economy, — political, social, and domestic, — education, the management of railroads, and the social condition of workingmen, all these have been his topics in books, pamphlets, magazine articles, addresses, letters, and lectures without number.

In 1871 he began his *Fors Clavigera*, monthly letters to the workmen and laborers of Great Britain, in which he gradually developed the scheme of his company of St. George, the task of his later years. They were continued until the sudden illness of several months ago warned him to return to his less exhausting and more profiting work of artistic teaching. This is not the place to attempt to estimate his writings. One sees with a regretful feeling how many undertakings are here catalogued which are unfinished, and of which it is likely that a great part must remain so. And while we can but admire the freshness and vigor with which he attacked such a range of subjects, one is tempted to deplore the versatility which urged him out of his chosen paths into the walks of other men.

This bibliography is not published, but we are informed that copies of it may be had from the author, whose address we do not find. We have heard, also, that a few copies have been brought to this country, and therefore may be obtained through booksellers.

AMERICAN POTTERIES.

IN the show-room of some suburban porcelain works may be seen two upright cases, in which, arranged on shelves, are exhibited samples of decorated china-ware. One of the cases contains only goods of European manufacture, and the other American goods. The difference in quality or finish, to an unpractised eye, is not apparent. Still many who are experts in the matter feel positive that under the most critical test the American goods would be held superior. The entire home pottery industry, of which the manufacture and decoration of china are but a small part, claims for itself also a high development, which the manufacturers believe will be generally conceded within a few years. It has already, they say, been recognized by dealers, although the public is as yet not educated up to the point of preferring home-made goods to foreign ones. Until within a few years this lack of popular knowledge was a great drawback upon the industry at large, for manufacturers were obliged to force their wares upon the market at prices little better than suicidal. They were sold, however, for a long time by jobbers and small dealers as imported stock, and consequently at enormous profits. To correct this evil and place themselves fairly before the public, the manufacturing potters organized themselves four years ago into an association, and since then conventions have been held annually. At the last convention, held in Trenton two weeks ago, forty firms were represented, including manufacturers of yellow and Rockingham wares, of cream-colored china, of white granite ware, and of pure china and decorated goods.

The manufacture of yellow and Rockingham wares, which is conducted chiefly in the West, was the first step towards introducing home products into the market. These wares are of the cheapest and most common order. Cream-colored ware, which is manufactured chiefly at East Liverpool, O., Jersey City, and Trenton, is next in the order of superiority. It includes common table ware and household crockery. Next in the order of manufacture comes "white granite," sometimes known as "American china." It is the best porous-bodied ware, and is superior to cream-colored ware chiefly because it has a vitreous glaze. It also is manufactured in Trenton, where there are sixteen potteries, and in other places in a smaller way. The manufacture of china is confined almost exclusively to Greenpoint, where it was first tried as an experiment in 1863, although no goods were put upon the market for two years afterwards. The superiority of china to other wares for household use is due to its homogeneity in body and glaze, neither of which is porous. Experiments in designing and decoration were from the first quite expensive, and had it not been for the high prices which prevailed for all sorts of ware during and soon after the war, the manufacturers would have abandoned them. Their aim has been to supersede not only imported ware but foreign designs, and to give to the decorated goods that leave the factory a distinctive American character. The Century Vase, for instance, which was exhibited at the Centennial, has a central figure in relief of Washington, medallion style, embellished at the corners with small pictures representing the chief industries of the country. Tea and dinner sets are decorated with native leaves or ferns or in a style pronounced and original. — *N. Y. World.*

BELLS AND TOWERS.

THE Rev. H. T. Ellacombe writes in the *Builder:* In the course of threescore years and ten of a long life I have gone up some hundreds of towers, most of them being of mediæval date. In many I noted the top timbers of bell-cages securely built into the walls, and no harm had come of it, though from early dates the bells had been swung up and down, and in pre-Reformation times they would have been rung daily, — *mane, meridie, et vespere*, — to forty-five degrees with the dead-rope wheel, but no damage had occurred to the building, provided the walls were of substantial masonry and well buttressed; but where the walls of towers are flimsily and scampingly built, as most modern towers are, there, no doubt, damage may be expected to follow from the very bells themselves; for, do what you will, the cage will oscillate, and so will the tower, and if the two oscillations do not occur together the ringer will occasionally find his bell "drop." Tower and bells should oscillate steadily together; but this cannot be effected unless the cage is firmly secured against the walls, and then in a well-built tower the whole will oscillate together steadily, like a pendulum, from the very foundation, and no harm will follow; but if there be an old split, caused by lightning, or settlement, or bad building, so as to damage the masonry of a tower, then the bells should not be rung at all, and that has been my advice when I have been occasionally consulted on the subject.

I have not seen St. Paul's bells, but, the tower being an engaged building, the cage may, without fear of damage, be firmly secured to the walls; for damage to accrue, it would be extended to the whole fabric, dome and all. A few years ago I was in the noble tower of L'Abbaye aux Hommes, at Caen, during the swinging (I cannot call it ringing, the bells being worked by the foot, without wheel and rope) of two heavy bells for service. The cage of massive timber was insulated, and the motion was so great as to produce the sensation of sea-sickness in one of my companions; and the oscillation of the lofty tower, with its glorious spire, was greater than I ever felt before, but there was no apparent danger, and it must have been going on daily for centuries. In flimsily-built modern towers, with affected lofty spires and small space within, there had better be no bells at all, but a single bell, dolefully to lament its position by solitary tollings, and standing as a dumb idol. In all such towers carillons might very safely and most effectively be set up.

COMMUNICATIONS.

PHILADELPHIA, January 3, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — In your notice of the "Late Competitions in Interior Decoration" (28th ult.), you state that you are unable to identify the author of the honorably mentioned design marked "H. in a circle." The design in question was claimed long ago, and returned to its author.

HENRY A. MACOMB.

SAN FRANCISCO, October 26, 1878.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — As you are devoting considerable space to the subject of plumbing, I would like to offer a suggestion. The main inlets of sewer gas are undoubtedly through the overflow pipes of basins and bath-tubs, which are always connected with the wastes. Why not disconnect these pipes and let them run out through the wall or down into the ground, as we generally do a safe overflow? The outflow is clear water and can do no harm if properly discharged; it need have no trap, and would not, therefore, freeze up.

This is a very simple, sure, and inexpensive remedy. It will only be necessary to keep the plugs in place to make an effective prevention of siphoned traps and inflowing gas. The idea may not be new to you, but I have never known of any one adopting this plan until I put it in practice in my own work recently.

Very respectfully, CHAS. L. BUGBEE, Architect.

[Our correspondent's scheme is unquestionably practicable in warm or moderate climates, — is practised in Europe, and if we mistake not in some parts of this country; we remember a case in Philadelphia. It is, in fact, the system which Mr. Norman Shaw, with characteristic boldness, has lately extended to soil-pipes, to the admiration of his countrymen. Its employment, in suitable climates, is more a question of taste than of practical difficulty. — EDS. AMERICAN ARCHITECT.]

THE INDIANA STATE HOUSE COMPETITION.

Indianapolis, December 30, 1878.

To the Editor of the American Architect:

Sir,— The long-looked-for pamphlet prepared by the disappointed architects in the last state-house competition is in the hands of the publisher, and will be in circulation before the legislature convenes. It is thought by some to forebode trouble, and perhaps influence the legislature to refuse any appropriation. The work has advanced so far now that it will require a strong influence to stop it, though it is now temporarily suspended on account of cold weather. The pamphlet gives a history of the state-house project from the first competition, intimates unfair dealings by the commissioners, and criticises Mr. May's design pretty severely as an architectural work. However, severe criticism might also apply to the designs of the critics themselves, and I think it might go hard with them if their work were submitted to a commission of architects. This state-house project bids fair to outrival the Chicago court-house wrangle. The public will hardly get a better opinion of the profession from such quarrels. If architects will enter into such competitions they should abide by the decision of the board. A lively struggle is anticipated when the legislature convenes. J. H. S.

NOTES AND CLIPPINGS.

Brumidi. — The Hartford *Times* describes Brumidi, who, for the past twelve years or more, has been at work decorating the Capitol. Although his great work is the allegorical painting on the ceiling of the dome, some of the work that he has done in the several committee-rooms and other parts of the senate wing will probably never be surpassed. This man, now almost about to leave the world, is certainly a phenomenon. Before he came to this country he made his mark in all parts of Europe, for it was the same Brumidi who did these remarkable works of art that decorated the walls of St. Peter's in Rome, which have always been admired, and which are admitted by all judges to be perfection, if perfection can ever be reached in anything. It was he also who did the decorations in the palace of the Czar of Russia, as well as other important work elsewhere. The old gentleman has become so feeble that he is now unable to climb up the steps leading to the rotunda, where he is painting a record of this country which will, if completed, reach entirely around the rotunda. It starts out with the landing of the Pilgrims, and will continue, scene after scene, until he reaches the Centennial, which finishes the first hundred years of the country. This work is pure fresco, and from the floor the figures are brought out so remarkably that even experienced persons suppose that they are statues. A derrick has been rigged, by which he is carried, every day that he is able to work, up to a stationary swinging scaffold. Large crowds witness his ascension, and hundreds are at all times, during the sessions of Congress, engaged in viewing it. It is with great difficulty that some people can be made to believe or understand that the various figures seen above are not real statues. Brumidi has been at work on this, probably the last work of his life, for over a year, and it is not yet more than one tenth completed. He says, however, that if he has good health and is able to work a little every day, he can complete the circle in about two years. It will be difficult, even if it is possible, in case he dies before he gets through, to secure an artist who can do so. The idea is entirely his own, and as he only makes his drawings as he needs them, no one else can complete the work as he intends if he lives long enough. Brumidi works on fresh plaster, which is put on the walls as he needs it. He uses three colors — white, a kind of pink or red, and black, making from these pearls and grays, light and dark, as he needs them for shading. Brumidi is, as almost every one knows, an Italian. He is over seventy years of age.

Order concerning Patents. — An order has been issued at the Patent Office to the effect that from and after January 1, 1879, letters patent and certificates of registration will be perfected and ready for delivery upon the date on which their respective terms will begin to run. Heretofore patents were signed and bore date of issue two weeks before they were completed and ready for delivery. Under the present arrangement the patent will be completed and ready for delivery immediately after signing. This plan will prevent the inconveniences which have arisen from the occasional necessity of withholding a patent after it had been signed, through the discovery of good reason for so doing within the two weeks of interval between signature and delivery. The Commissioner of Patents is also arranging to reduce the time between the granting of a patent and its actual issue from two weeks to one.

Purifying Sewage Water. — The sewage water from Paris, taken at the bridge near Asnières, is said to contain one kilogramme of solid matter to the cubic metre, of which amount thirty-seven grammes are nitrogenous matter. This water is treated with sulphate of aluminum, whereby all the phosphoric acid, two thirds of the nitrogenous matter, and rather more than one half the potassium salts present, are completely precipitated, and perfectly clear, inodorous water is left, which may be run off into the rivers without injuring the purity of their waters. Experiments made at Rheims, to determine the value and applicability of various processes of treating sewage, show an important advantage in the use of lignite. — *New York Sun.*

Statue of Brougham. — A statue of Lord Brougham will soon be erected at Cannes, in the South of France, and the anniversary of his birth will be celebrated with village fêtes. Lord Brougham first made Cannes a winter resort for English.

A Bust of Coal. — A Silesian sculptor has enriched the Town Hall of Königshütte with a bust of the Emperor chiselled out of common coal. It is an excellent likeness and well executed.

Agricultural Labor in England. — Up till last Michaelmas the average wages of an agricultural laborer in Kent were about two shillings and eightpence a day. The Farmers' Association agreed, at that date, to give notice to the men that in future they should pay them only two shillings and fourpence, or in some cases two shillings and sixpence, a day. As the men naturally did not welcome this announcement, the union counselled resistance, and the lock-out is the consequence. Further, upon the men refusing to accept this reduction, some of the farmers have given them notice to quit the cottages they occupy on their land. In justification of their conduct the farmers urge the low price of corn, the general depression of agriculture, and the fact that their men are receiving more than they did ten years ago, while their (the farmers) position is in every respect worse. And as to the "evictions" from their cottages, they argue that if the work they offer is declined, surely they have the right to compel the men to leave the cottages erected for the latter's convenience upon their land. The men, on the other hand, point out that the wages they received were paid by the day; that many days of the week in the autumn and winter were unfit for agricultural work; that hence their earnings, considering the high prices of commodities in general, were only barely sufficient at the original rate; and that if the corn and hop crops have paid badly, the fruit crops, pastures, and stock have paid well. Again, the proposed reduction, they contend, would really make very little difference to the farmers, while to the men the loss of a shilling or eighteenpence from their not too high wages is a matter of the greatest importance. The farmers, however, do not see the force of this argument, and still hold out. There are one or two special features which distinguish this struggle between employers and employed from many others. As I have pointed out before, the union to which the men belong is of a totally different character to most of the trades unions in other parts of the country. During the eight years of its existence it has done a wonderful amount of good in many ways. Moreover, the men themselves are far superior to the average English agricultural laborer. A Kentish man's range of experience is wider, his knowledge and perhaps his natural intelligence are greater, than that of, say, an Essex man, and should neither side in the present dispute give in, and the "Kentish colony" in Canada, now talked of, become a reality, the farmers will certainly miss the skill of the laborers who may be thus compelled to leave their native land. — *Letter from England in Toronto Globe.*

Quicklime as a Substitute for Blasting Powder. — The *Scientific American* says that unslaked lime compressed into cartridges, or used loosely and well tamped down in the hole, using water or other liquid to saturate and expand it, is now proposed for use in fiery coal mines. It is claimed that the advantages to be derived from its use are economy in the production of coal; making less slack than by using ordinary blasting powder; lives of colliers are in less danger; the breaking or shattering of coal back of the charge — which is especially characteristic of the use of gunpowder — is avoided; and the quality of the atmosphere is rather improved by its use than otherwise.

Draining through a Neighbor's Land. — An important matter, as affecting the private rights of farmers and land owners, has been started in Indiana. A bill was prepared and indorsed by the Tile Draining Association at a meeting three weeks ago, to be presented to the legislature, providing for the drainage of wet lands. It provides that where it is necessary to construct open or other ditches through the lands of another party, in order to drain wet lands, a petition setting forth the facts may be presented to the County Commissioners in such county, when that body shall appoint viewers. These viewers are required to make an examination of the proposed work, and report the propriety of it, benefits and damages, cost, etc. The benefits to be taxed to the land so benefited. The work to be let to the best bidder.

New Castle on the Island of Herrenwörth. — King Louis, of Bavaria, it is said, is building on the Island of Herrenwörth, in Lake Chiemsee, a castle which will cost $8,000,000, and be the most sumptuous royal residence in Germany. It is to be a reproduction of the Château of Versailles, with a great central block and two wings; the court will be occupied with balustraded terraces, covered with colossal statues of eminent Bavarians; the gardens, laid out in the French style, are to be ornamented with mythological groups of statuary, massive marble seats, and vases of bronze; the famous *Tapis Vert* of the Orangery is to be reproduced, and the water-works will be on the model of those of Versailles.

An Impressionist Picture. — The boy whom Mr. Whistler implored, after sitting down on a palette, to stand still because there was an exquisite Turner on his breeches, has been outdone by the wooden partitions of a drawer, in which for twenty-five years Mr. Calvin Hervey, of Belfast, Me., has kept his tools. The scratching of the implements as they rattled around in the drawer, the action of the oil which mingled with the rust turned green, the dust and grime of a quarter of a century, all combined to paint on these pine board partitions a tolerably good sketch, in dull colors, of the ocean with three vessels sailing on its bosom, and in the distance a headland with a lighthouse. Mr. Hervey has had the picture framed in gilt, and it hangs over his repairing bench for inspection. It has not yet occurred to him to call it "A Coincidence in Dirt," and ask two hundred guineas for it. — *New York World.*

A Great Bell. — Tradition assigns to Moscow the ownership of the largest bell in the world, playfully designated "Ivan the Great." On the 12th inst. a new bell is to be solemnly blessed in the Church of the Redeemer in the same city, in memory of the emancipation of the Bulgarians. This bell is smaller indeed than the monster Ivan, but is still larger than any other in the world. When the bell was delivered at the church by the contractor who had cast it, he declared its weight to be 1802 puds, or 36,040 kilograms (35 tons 7 cwt. 104 lbs.). Some members of the committee who had charge of the business were not satisfied with the statement of the bell founder, and took steps for having the weight of the bell ascertained independently. It was found that the actual weight was 6960 kilograms (6 tons 16 cwt. 80 lbs.) less than what had been stated, which made a difference in the price of the bell of 3201 rubles (about £480).

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, JANUARY 18, 1879.

CONTENTS.

THE opening of the New York State Capitol, last week, incomplete as the building still is, — only about a quarter of it being yet ready for occupancy, — is the most important architectural event of our day since the completion of the United States Capitol at Washington. The building will be in fact, if it is carried out in the spirit in which the work is now going on, the next in point of cost to that at Washington; for while its dimensions are considerably less, it is finished on a scale of greater magnificence and of more genuine and durable, and therefore of more costly material. We give on another page a careful and detailed account of the building as it now is, which will be read with interest, we think, by those who have seen it as well as by those who have not. Whatever may be the opinions of those who see the building, as to the original merits of the battle between its architects, or the special criticisms to which in its present estate it is open, there can be no serious question that as an artistic achievement the building has gained very greatly by its change of architects. The unity of a harmonious whole it can never have. The architects who are now in charge of it will not sacrifice the individuality of their own ideas to the beginnings of their predecessors enough to secure this, nor can they for its sake sufficiently harmonize their diverse manners of working in the separate portions into which they have wisely divided it among themselves. Thus the stimulating influence which it will unquestionably have as an example of design will lose something in this respect. But instead of the monument of commonplace splendor which was originally promised, we have now a work which in its different parts is up to the highest level of professional attainment. We have work of vigor, individuality, and artistic power, which, in spite of a forced conformity to an original scheme that does not suit with it, and that involves many shortcomings in the final result, will give it a place of permanent honor.

THE opening ceremonies were of great splendor, ten thousand or more persons being gathered in the building, it is estimated. The people of New York are proud of their capitol if we may judge by the criticisms in the city papers, most of which have described the building at length, and with liberal admiration. There are those who scold about the cost of it, and some papers have no good word for its architecture. Thus the *Commercial Advertiser*, in its account of the opening, wonders that "the idea never entered the stupid heads of the architects and the commissioners" to provide more room for spectators in the galleries of the assembly chamber, or that this room and the senate chamber should be remanded to the upper story; and thinks that there is no public building in the country so badly arranged. It does not stop to remember that these faults were essentially fixed upon the building before the commissioners and their advisers meddled with it, nor to concern itself with the serious labors of the architects further than to say that "the architectural display is a mixture of High and Low Dutch, Bruyn, Eidlitz, and Dorscheimer." So much for popular appreciation of the highest artistic effort, — an appreciation which is less encouraging than that of the critics who have set the Romanesque architecture beneath the Renaissance, because it betokens less interest.

WE have seen very reckless estimates of the amount of money that has been spent on the building thus far, ranging from seven to sixteen millions of dollars. Up to 1876, when the change of architects was made, more than seven millions had been appropriated for the building, and the most of this had been spent. Since then the total appropriation has reached nine and a half millions, and the expenditure over nine millions. The estimate of the Advisory Board for finishing the building according to their original design was four and a half millions; but the design has been changed, and some millions more will be needed, — how much, probably no one can say accurately. Governor Robinson, in the first message delivered to the legislature in their new quarters, summed up its history reproachfully, and recalled the restriction under which money was first voted for it, — that the whole cost should be limited to four millions. He reminded the legislature that only one wing out of four was as yet completed, and urged that, although the adoption of the original plan had made the restriction impossible, it was possible to finish it in much simpler style than was intended, and that the unfinished parts, although long uncovered, had not suffered, nor were likely to. He therefore recommended the legislature to stop its appropriations for the time, and insist upon deciding how it should be finished and at what cost. The people, he said, were ill able to pay the tax demanded for it, and he added: "If we concede the artistic merit claimed for the present design, it yet seems to me that in times like these the food and raiment of our people are more to them than the development of schools of art." One is tempted to wonder who persuaded the governor that unfinished work exposed to the weather did not suffer from the exposure. With the ability of the people of New York to pay the tax demanded, or with the question of "schools," we need not meddle now; but there are those who think that the development of art is a thing worth considering even beside food and raiment, so long as it is not a question of actual destitution. There are persons who like, after they find themselves decently clad and comfortably fed, instead of spending more in that direction, to spare it for a picture or a bit of decoration, or for something else that depends upon the development of art. One cannot have the architecture of a state-house, or a hall of assembly, or even a great mural painting in his own house, as he can have a picture; but then those things are visible to a great many people, and cost much less per head, besides being monuments for generations.

TWO other States, Connecticut and Michigan, have in like manner celebrated their New Year by occupying their new capitols. The Connecticut capitol, at Hartford, of whose main staircase we not long ago published a drawing (see *American Architect*, November 9, 1878), has been building since 1872, from the designs of its architect, Mr. Richard M. Upjohn. It is an imposing building of white marble, vigorously grouped and rich in detail, treated in the broad and rather horizontal Gothic which Mr. Upjohn is fond of adopting in his civic work. Its design must be tolerably familiar to most of our readers; and we shall not attempt any description of it until we are able to lay it before them in illustrations. It was soon after the oscillating legislature of Connecticut decided to fix itself at Hartford, that a new capitol was decided on. The state appropriated half a million dollars for it on condition that the city should do the same, and should provide a site. The city bought the grounds of Trinity College, adjoining its own park, and gave them for the purpose, receiving in exchange the title to the old capitol at Hartford when it should be disused. In a competition for designs Mr. Upjohn's was accepted, and contracts for it were made in October, 1872, the cost being fixed at eight hundred and seventy-five thousand dollars. When the work had gone on for a year the legislature decided to change the character of the building, making it fire-proof throughout, and increasing its elegance. A new commission was appointed, with power to get new plans and increase the cost to a million and a half. The commission finally settled upon a modification of Mr. Upjohn's design, on which, to suit their idea of due dignity, they had obliged him to engraft a dome. This was authorized by the legislature and new contracts signed while the limit of cost was extended to two millions and a half. The building is now done as far as its practical uses are concerned, and was formally occupied by the legislature last week. The only things that remain to be done for the building itself are to finish the dome, of which half the panelling of the brick shell is in place, and some details of the roofing and sculpture, all of which, the commissioners say, will be included within the appointed cost.

A characteristic and, for American architects, unusual thing in the design is the amount of figure sculpture that is disposed about it. A colossal winged bronze, typifying the Genius of Connecticut, stands on the lantern, and twelve figures are to crown the pillared buttresses of the dome below, which is dodecagonal in plan. Some of these are finished, but they are not to be placed till the spring. Besides these, canopies and pedestals are provided on the fronts for twenty-two other statues, and the tympana of seventeen arches are to be filled with historic sculpture. Upon one of them, as the commissioners say naïvely in their official report, they "have had carved a correct likeness of the historic Charter Oak tree." The people of Connecticut, as well as those of New York, can afford to be proud of their state house. They might have had still more reason for gratulation, we believe, if their commission had not yielded to the besetting temptation to interfere with the architect in his own domain, forcing upon him a dome which all his skill has not been able to make fraternize entirely with the rest of his architecture; and, if we mistake not, their hand is to be seen in some other details of the work.

The Michigan legislature occupied their new building on the first day of the year; and the people of the State are congratulating themselves that it has been completed, substantially, within the original estimate, and in the time agreed upon. The legislature were fairly frightened out of their former capitol in 1871, partly by a timely fire that gave warning of its combustibility, and partly by a yielding of the floor of the State Library, which threatened to fall upon the legislators beneath. A building commission was straightway appointed, a limit of $1,200,000 fixed for its cost, and a competition for plans opened. Mr. E. E. Meyers was selected in the competition as architect, a contract for the building was made within the prescribed limit, and the corner stone was laid in October, 1873. The actual cost of the complete work is $1,390,000, which includes some small items ordered by the legislature, in addition to the original contract, the chief of which are a steam-heating apparatus, and a stone cornice and balustrades wisely substituted for the original cheaper and inferior feature. The building is an oblong of 336 feet front and 180 feet deep, built of Amherst sandstone. It consists of three projecting masses, a centre and two wings, connected by recessed curtains. It is of modern classic architecture, three stories over a rusticated basement, the projecting portions faced with an applied order in each story. The central mass carries an attic. The roofs are flat and balustraded, with low pediments over the centre and wings. Out of the middle rise a dome and lantern of unusually elongated profile; the drum of the dome being surrounded by a circular colonnade which rests on an octagonal stylobate, and is broken by a projection on each cardinal face. A two-storied portico with high steps marks the central entrance. This is the only one of the three new capitols in which is preserved the old ideal of a State capitol, — a classic building with porticos and a central dome, — an ideal which in these days seems to have taken refuge in the West.

The various steam-heating schemes that are urged in New York do not seem to make great headway. The mayor has vetoed the last of them, the Webb scheme, at the very end of the expiring Aldermanic Board's term of office; so that, as the corporation counsel decides, there is no time for the old board to pass it over his veto, and the new board cannot take it up, since the unfinished work of the old goes out with it. At the same time the counsel has given the opinion that the Spinola concession, which was carried over the mayor's veto, is illegal, because it confers privileges which the city is not authorized by its charter to confer; because it contains no limit of duration, and reserves no right of revocation, and so would bind the city perpetually; and because it delegates to the Commissioners of Public Works powers which the City Government does not possess. If these objections are confirmed, the whole business will have to be begun *de novo*, and the question transferred to the legislature, with prospects of a different result, as other questions of the policing of New York city have been transferred. In the mean time, while the Lockport system is extending to other towns, practical questions are coming up which have not heretofore attracted much attention; for instance, how long a network of underground pipes can be expected to last, under a pressure of two hundred pounds to the inch, without bursting; and whether, when the length of pipes traversed becomes great, the condensation will not become expensive and annoying. The steam is delivered through meters, and the consumers are taxed accordingly; the question then occurs also whether the remote consumer, who receives his steam wet, that is, partially condensed, with a loss of some of its efficiency, shall pay as much for it as the near consumer, who receives it in its dry condition, almost direct from the boiler, — in other words, whether the remote consumer or the company shall bear the loss of the partial condensation of the steam in its course. But if the views of the corporation counsel prevail, there may be time to settle these and many other questions by experience elsewhere before the steam gets to New York.

The death of Mr. Franz Xavier Dengler takes away from our country one of the most promising of her young sculptors, and one of the very few who have entered their profession with the advantage not only of talent, but of thorough training. He was of German race, but was born in Cincinnati, in 1854. His artistic promise was early. At seventeen years old he was sent to the Royal Academy of Fine Arts, at Munich, where he was a pupil of Wagmüller, and quickly distinguished himself, winning the admiration of the clever colony of Americans who were his fellow-pupils. After five years of study, he returned in 1876 to Cincinnati, where he worked for a year without attracting much attention, and then came to Boston. Here the spirit, the skilful technique, and the artistic feeling of his work brought him immediately into honor, so that he was soon engaged to take charge of the classes in modelling in the Schools at the Museum of Fine Arts. His careful training, freshness of feeling, and the enthusiasm with which he inspired his pupils made his teaching very successful, and promised admirable results from it; but the sudden development of consumptive symptoms obliged him, after a season's work at the Museum, to leave Boston. A year ago he went again to his home at Covington, then to Colorado, and to Florida, in search of a climate in which he could live; within a week the news of his death has come back. Naturally, he left but little finished work behind him, — a portrait-bust, a little group of statuary, a number of vases decorated with charming figures; but that little was full of promise. He was engaged to model the three figures in terra-cotta of painting, sculpture, and architecture, for which pedestals are set at the entrance to the Museum of Fine Arts; and his sketch models for them were nearly finished when he left Boston. Our country has not succeeded well in rearing a family of sculptors. It has been a habit of her indigenous sculptors to make themselves, with a little help from Congress. The most distinguished of the older ones have been persistent absentees. Of the two among her younger ones who have lately come back to her in all the promise of a solid training, fresh enthusiasm, and exceptional gifts, Mr. St. Gaudens has gone again to Paris, with no present indication of returning. Dengler has now been taken from her, and she does not know where to look for their successors.

We are informed as we go to press that the Washington Monument Commission has decided in favor of Mr. Story's plan, and has recommended it to the Committee on Public Buildings and Grounds.

ARCHITECTS' COMPETITIONS.

III. DISTRIBUTION OF PATRONAGE.

The considerations which we have thus far cited tend to show that architectural competitions are on the whole of doubtful benefit to the client; and that, except for certain advantages which we have yet to consider, it is questionable whether they are to be desired by architects themselves. Nevertheless clients believe them to be useful, and architects like the excitement of them. So they are popular, and will for the present continue to be so. It seems to a client to be a great advantage that he can have several ideas to choose from, instead of one. In cases where the problem is a difficult one there is some gain to him in this, provided only that he can get several ideas from the right kind of men, a gain which under good management might be of much value to him, though as things go it is pretty apt to come to naught. On the side of the profession it is not to be forgotten that competitions add nothing on the whole to its practice or emoluments. They make no additional work, that is, they do not increase the amount of building, but they do require a great deal of extra labor from architects, and so add consider-

ably to the burdens of the profession, and they in the long run rather diminish than increase its total compensation, we suspect; for while the extra premiums distributed, when there are any such, amount to virtually nothing in comparison with the whole amount of labor rendered in them, not only do competitions tend in too many cases to dishonorable undercutting, but committees make use of their attractions to offer a lower fee than they would have to give for the services of a well-accredited architect engaged in the ordinary way. This, then, gives additional force to the point on which we have before insisted, — that they are an exceedingly costly means of distributing patronage, and that the cost is to the architects.

On the part of architects, the most cogent arguments in favor of competitions are those to which we have already referred, — that they seem to offset the ascendency of individual reputation, and that they give an opportunity to young or unknown men to make their merits known, and secure their share of patronage. The ascendency of names is certainly one of the checks in the way of young practitioners. It is at the same time one of the reasonable rewards of a professional career. A professional man is entitled to the reputation which abundant and skilful service brings him, and it ought to be a source of profit to him. To make a well-earned reputation of no effect would certainly be an injury to any profession, for which any device for encouraging unknown ability would hardly be compensation; for it would destroy one of the strongest incentives to careful qualification, to diligence and faithfulness in practice, while it would invalidate what after all is the client's best security in choosing a professional adviser. It would encourage one of the crying evils of our profession by stimulating architects to give their attention rather to securing work than to doing it well. Therefore, the prevalence of a system which should neutralize the advantages of a professional reputation is by no means a thing to desire.

At the same time the great accumulation of work in a few hands which is often seen is a thing to be deprecated; for a few men are apt to have more in their hands than they can do their best by, and the architect who is tender enough of conscience to refuse to do more work than he can do well is scarcely to be found. There are some real benefits, then, in a system which gives capable but unknown men a chance against those whose reputations overshadow them. This is given to some degree by competitions. How far it is given, and how far its benefits countervail their disadvantages, are questions which it is not very easy to answer; to a crowd of hungry aspirants the benefits naturally loom large, and the disadvantages look small. It is of course only to open competitions that these benefits belong; but they, as we have argued, are those of which the advantage to the client is least, and which most encourage all the abuses of competitions; so that it is not well to commit ourselves too far to the advocacy of unlimited competitions without considering how their recommendations in this respect really weigh in the balance.

We can all cite instances where men of ability have been brought forward from obscurity by a competition design. The case of M. Garnier, architect of the Grand Opera at Paris, is a notable one. He was as unknown as any winner of the *prix de Rome* is likely to be, until his design for the Opera won in the great trial. Our readers' memories may furnish other examples nearer home. But there are two qualifying conditions to offset such examples. The men of exceptional ability who come to the front in competitions have commonly just the kind of ability which would bring them to the front without them. Those who win in one competition are those who win again and again; and they are those who are equally successful in securing employment where there are no competitions. One of the most prosperous architects in New York said once that it was a mere farce for him to go into a competition, for he always won; and it was true. So far as men who have a talent for success are concerned, competitions are after all only an additional means of enabling them to outstrip their slower-footed fellows. Experience does not show either that they are any more likely than other means to discriminate solid excellence from the dash or pretence that is apt to carry the day in a personal trial. The same showy qualities that prevail in the one case prevail in the other.

And then we may well question how great is the proportion of obscure talent that is brought to light by the fortuitous decisions — we cannot describe them in any more respectful way — of ordinary competitions. If some means could be enforced by which these decisions could be made to detect real merit, it would be an advantage to struggling practitioners, and still more a help to the course of good architecture. Under exceptionally good management, competitions may do this; but that it is their common result no one would be less inclined to argue than architects themselves. For one unknown ability that is brought into recognition, there are many cases of important works saddled with inferior designs, or intrusted to architects who prove untrustworthy or unskilful, inexperienced, visionary, or otherwise incapable. For whether or not competitions attract good architects, which they sometimes do and sometimes fail to do, the inexperienced, the shiftless, and the adventurers of the profession always flock to them. So long as they must be regarded as lotteries, in which the prizes are for the good, the bad, and the indifferent alike, it is much to be questioned how much the benefit of their encouragement offsets their abuses.

There is one way, however, in which competitions may do a considerable good to young architects, and that is, in giving them practice in designing for a purpose, and for works of greater scale than their ordinary practice would give them. The problems young men work over in the schools have necessarily an air of unreality; those that they study in offices they study without either the stimulus or the freedom of their own responsibility. Those that their clients intrust to them are apt to be comparatively small, and in the leisure intervals of early practice, it is to be feared, they are not assiduous in setting themselves tasks for practice. We once heard an architect of experience say that his advice to a beginner would be to go into every competition at which he could get a chance, for the mere sake of getting experience in designing. No doubt this was sound advice in its way. Competitions give admirable opportunities to unripe practitioners for learning one part of their business. But this gives the more reason for distrusting success in them. It is well for them to have the benefit of practice in design for actual uses, but that they should learn their business by costly experiments in building at the expense of their clients is undesirable. We are tempted to say that nothing would be so good for a young architect as to go into competitions, if he can only be assured of not winning in them. However it may be in more conservative countries than ours, or even here in professions that are better established than architecture, and their requirements better known, it is our impression that in the United States the way of the young architect is made too easy rather than too hard; that he is encouraged to go into practice without proper training, and to undertake important work before he is fitted for it; that therefore any contrivance for hurrying him into positions of responsibility, and saving him from the plodding that usually falls to young men, is to be looked upon with suspicion. This sounds like hard doctrine; but when we consider how many young careers that begin with conspicuous undertakings fail to fulfil their promise; when we hear of a notable building by some clever man without experience which fails in a dozen practical requirements, or costs twice as much as was intended, or of one which, built by some promising ignoramus, tumbles down before it is done, we cannot help wishing that delays rather than helps should be put in the way of callow architects, so that they might be forced to earn their experience in ways less costly to their clients, less derogatory to their profession.

THE NEW ARCHITECTURE AT ALBANY.

To the Editor of the American Architect:

Sir, — The provisional occupation of the Court of Appeals Room at the Capitol at Albany, by the State Senate, and the permanent occupation by the Assembly of their magnificent Chamber, on Wednesday, the 8th instant, were preceded on Tuesday evening by a grand reception, at which the new architecture of the great building was for the first time displayed to the public. As the evening was distinctly architectural, rather than social or political, it seems eminently proper to accept the challenge suggested by the occasion, and seriously to discuss this latest, most imposing, and perhaps most significant manifestation of the national progress in art. As a contribution to this discussion, the writer, who was fortunate enough to be present at these opening scenes, ventures to accept your invitation, Mr. Editor, and to give the result of his impressions, with the frankness which befits a theme so interesting and important.

The history of this undertaking is too well known to be again rehearsed, and much of it would not be germane to a purely architectural discussion. It is sufficient to say that two architects of high reputation have, in this building, undertaken the very serious task of completing and correcting a work begun by another professional brother, and carried on by him, at vast expense, to a point which must necessarily commit all subsequent work to the realization in great

part of an architectural scheme defective in certain fundamental points. A *résumé* of the report of Messrs. Eidlitz, Richardson, and Olmstead, with respect to the original design, when they were acting as a professional Advisory Board to the Capitol Commission, was published in this journal March 11, 1876, together with reproductions of the first studies of their proposed alterations. The violent contrasts between the original and this modified design, the sudden and phenomenal transition in the latter from the well-defined Renaissance of the two lower orders to the equally well-defined new Romanesque in the upper orders, and the fundamental change in the character of the skylines, elicited, it will be remembered, a very formal expression of dissatisfaction from one or more chapters of the Institute, followed by a resolution of the legislature, requiring that the building should be completed in the style in which it had been begun. After Messrs. Eidlitz and Richardson, the professional members of the Advisory Board, had been constituted the architects of the building, and they had assumed the actual responsibilities of construction, their more deliberate studies and their more serious reflections were, it may be supposed, sufficient in themselves, without any extraneous impulses, to cause an essential modification of the most objectionable parts of their original scheme of alteration which was evidently merely a preparatory study. The fruits of this sober second thought are very evident in that portion of the exterior which is advanced towards completion, namely, the new north front, which, it may be remembered, according to the original conception, that has not been fundamentally changed in the plan, is composed of two square flanking pavilions, the curtain wall between them being broken by two comparatively slender towers enclosing the main central division of the façade. This curtain wall has been, throughout this front, reduced from the original in height by one story, and the central division between the two towers is now crowned by a vast steep roof, of severe and effective outline, covering the new Assembly Chamber, and broken by well-designed, tall chimney-shafts, the whole recalling the French civic architecture of the fifteenth century, of which the Château au Blois may be considered the type. These curtain walls are crowned with balustrades and tall gabled dormers, also conceived with the feeling of early French Renaissance, and certainly well composed. The Romanesque arcade of windows, which in the published design audaciously surmounted the Corinthian order of pilasters below, and arrogantly disregarded its centre lines, is now adjusted to the order upon which it rests in this latter respect, is increased in height, and its Romanesque quality seems to have been modified by certain late Roman characteristics, such perhaps as might have been seen rather in the palace of Diocletian at Spalatro than in that of Frederick Barbarossa at Gelnhausen.

The corresponding window in each of the two towers which flank this arcade is still, however, distinctly Romanesque, its jamb shafts being Lombardic or Norman, and the audacious spirit which controlled the first condemned study of alteration has left its trace upon the cornice of the Corinthian order below, which has been very frankly changed in outline to the profile of a vigorous Gothic string-course. If in the portico, which is to project from the lower order of this curtain wall, the architects can manage to carry out a corresponding freedom of design without too boldly challenging the order with which it will be continuous, it will be possible to leaven the mass, and obtain a certain degree of unity in the result. Even as it is, the whole composition up to this point is certainly more interesting by far than if developed in a coldly classic spirit, with no inspiration higher than mechanical correctness. Although such amalgamations as this must needs offend from the technical and academical point of view, they have in them certain elements which must commend themselves to him who has at heart the rehabilitation of architecture, to the end that it may express rather the boldness than the timidity of knowledge. In the presence of this especial experiment the spectator who knows and venerates his orders will be pleased at the general result so long as he allows himself to be led by his first emotions, but when he has time to bring his learning to bear on the subject, and spies out the anachronisms of detail, he will be apt to recoil in astonishment from his first impulse of approval, and say, "Is this indeed the architecture which is promised, or are we to look for another?" Evidently the combination so far is not the result of mere vulgar audacity nor of ignorance, for there is a unity of spirit about it, if not of letter, which could not have been fortuitous. The new ornamentation is bestowed with a spirit of elegant reserve. Above the cornice of the second order appears the decorated belt, which was a feature of the original study of the present architects; the two Romanesque windows in the towers are made especial points of enrichment.

The pediments of the dormers are also embellished with sculpture, and under the cornice of the high central division is a rich shell frieze, the effeminate delicacy of which is judiciously corrected where the same feature occurs on the unfinished north façade. This statement comprises, so far as I remember, substantially all the decoration.

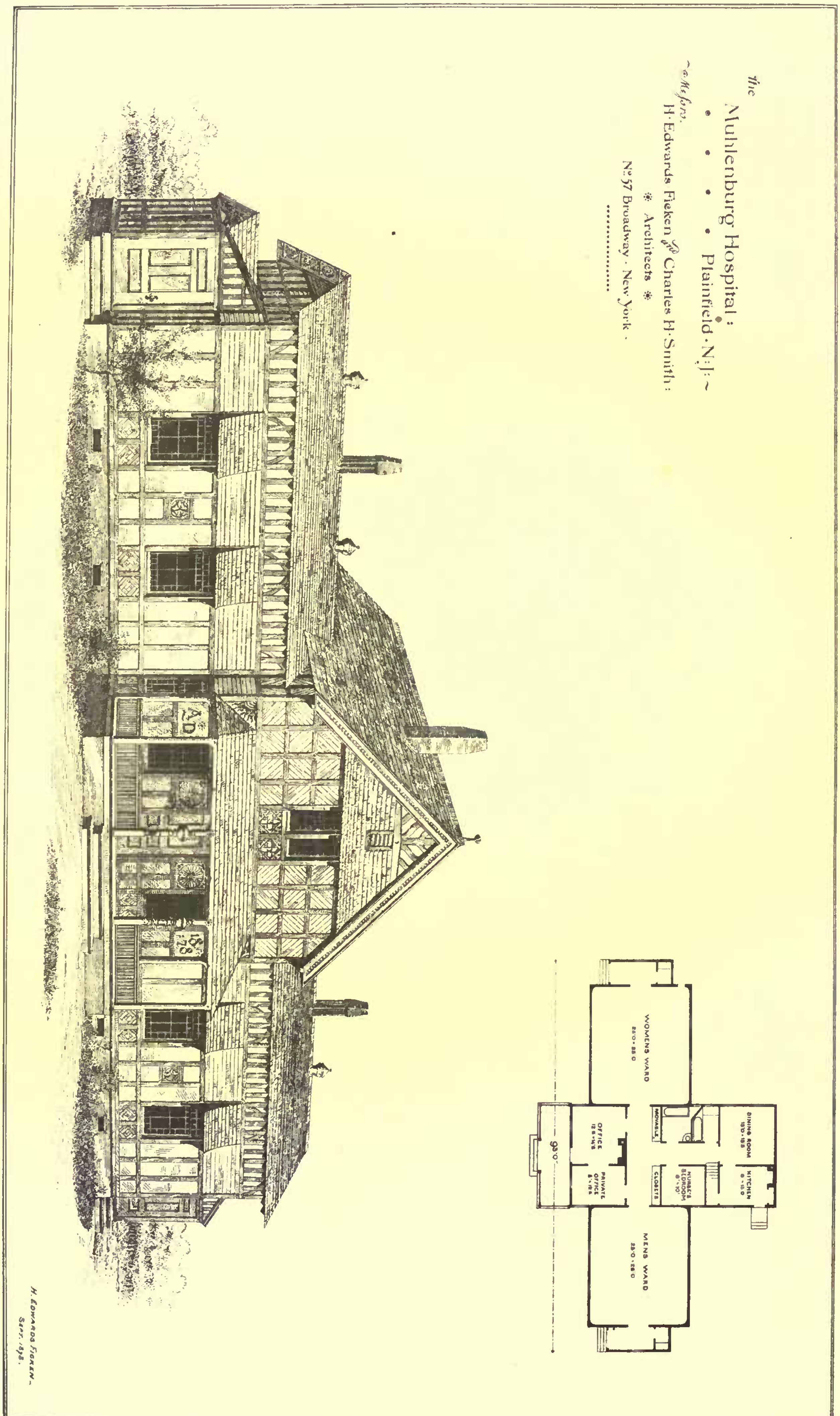
Of course, Mr. Richardson, to whom the work on the exterior has been assigned, will know how to make use of the picturesque skylines of the French châteaux on the corner pavilions of this north front, as he has done on its central division over the Assembly Chamber; and with his peaked roofs, high dormers, and lofty chimneys, he will be enabled to create a very effective façade, especially when viewed in the somewhat violent perspective compelled by the comparatively narrow street on which it stands. The same remark is true of the south façade. But Chambord itself will scarcely give us a prevision of the effect of the main east façade when the towering dome is united to the other aspiring features of the composition. Mr. Richardson has not signified in what manner this difficult feat of design is to be accomplished. Certainly, the heavy German Romanesque of the dome in the original study of the Advisory Board, before it can in any respect be affiliated with this new work, must undergo a fundamental change.

The only portions of the interior which are at all complete are the Hall for the Court of Appeals in the first story above the high basement, the great Assembly Chamber occupying the two stories above, one grand staircase giving access to these, a great entrance hall, and various surrounding corridors and offices; all these occupying the main part of the south wing, and comprising apparently less than one quarter of the whole building. For this part of the work Mr. Eidlitz is responsible, and to it he has brought the resources of a trained intellect, great experience and boldness in design and construction, and an inventive power which has already been exhibited in many important works. These qualities have served him well, especially in the lower parts of the building, where the work had been already so far advanced when it fell into his hands that his task was confined to the adjustment and extenuation of existing features. But in the newer parts, where he was less embarrassed, he has given us an example of honest and elegant workmanship, of careful design and profuse invention, which cannot fail to exercise a great influence upon contemporary art in this country, but which, in its present application, exhibits also such a contemptuous disregard for the style to which he was called upon to adapt his ideas that one hardly knows whether to admire him for the boldness of his convictions, or to be amazed at his want of sympathy for what we have been accustomed to regard as the obvious proprieties of design.

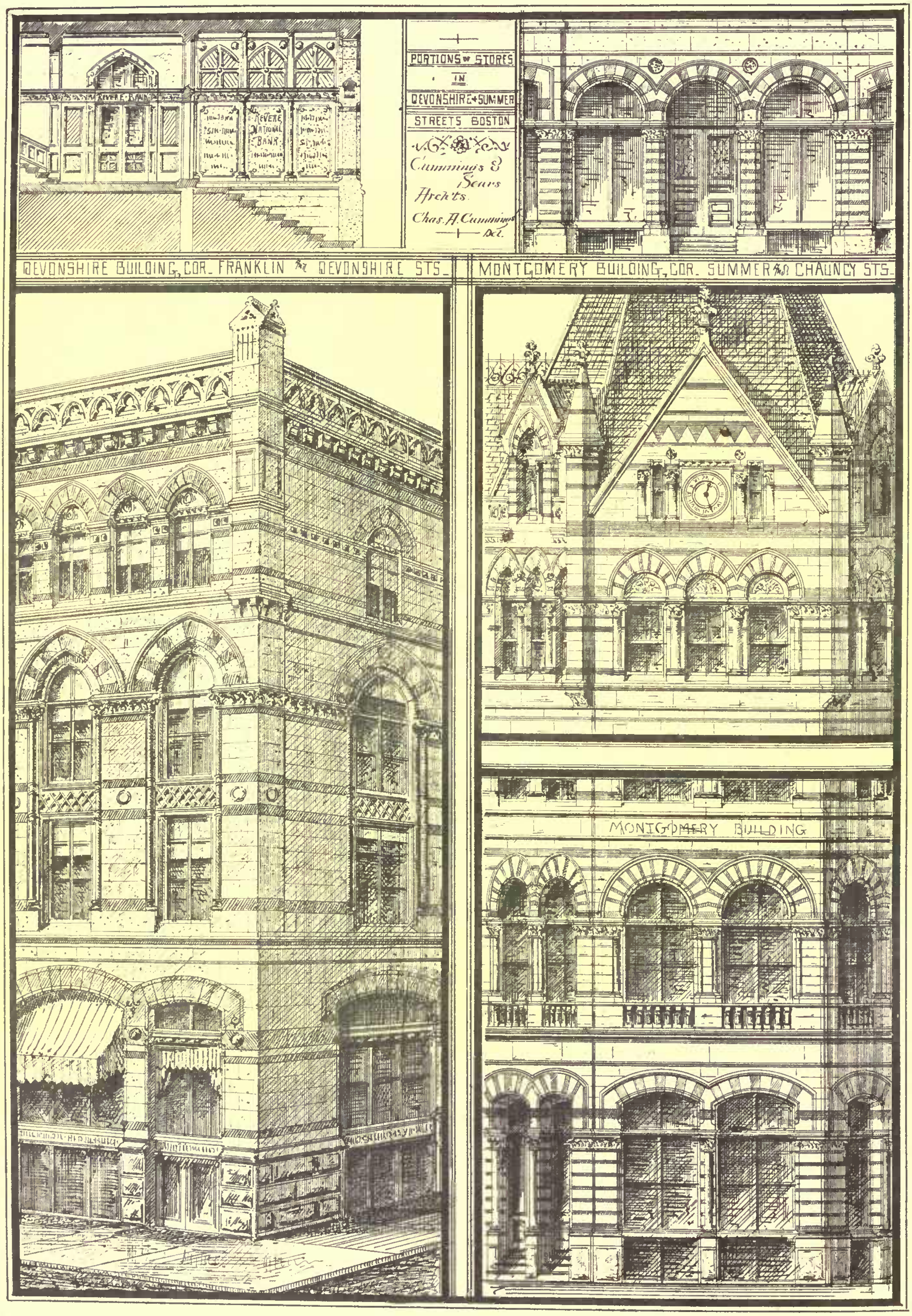
His interior is unrelenting Gothic, without any touch of affiliation with the mask of orders which encloses it. It is possible to imagine a mediævalism so adapted even to classic conditions that the line of demarcation would be hard to find, — a reconciled mediævalism and classicism which would impress the beholder with the idea that the learned and accomplished architect of the nineteenth century knows how to use his great inheritance of architectural forms so as to create a harmony even among the most discordant elements of design. But no such harmony is here attempted, and Mr. Eidlitz has allowed himself frankly and openly to make an absolute and sudden change in the fundamental idea of the composition. According to this new dispensation, the lion and the lamb lie not down together. The function of the modern architect among his books is indeed liberty, but it is not license; he should be in the largest sense cosmopolitan, not partisan, in his use of knowledge; this perpetuation of the battle of the styles in a monumental building, which should be a standard of progress, is therefore an ill-timed offence to the spirit of architecture, and implies a presumption of popular ignorance or indifference upon the subject which should not be allowed to pass without notice.

If an architect of the thirteenth century had built a vaulted hall in his own fashion, within the shell of the Roman amphitheatre at Pola, we can imagine that he would have done the very same sort of thing that we see at Albany. But an architect of the nineteenth century in America should be held to a very different account in a similar emergency, for obvious reasons.

Forgetting, however, for the moment this confusion of tongues, we may study Mr. Eidlitz's Gothic with pleasure and profit. It is, as we have said, solid and monumental work which he has given us, thoroughly studied, and, within the arbitrary limitations of the style which he has chosen to set for himself, there is no better or bolder modern composition to be found anywhere, none with more refinement and elaboration of execution, and none with more ingenious and beautiful detail. The great staircase is in two flights, and is a grammatical example of modern Gothic in the English sense. It is built in light and dark sandstones around a square well, which is enclosed in an open screen of columns and pointed arches carried up to the highest runs of the stairs, and there stopped. These arches on the ranges are stilted on the lower side in each case, the higher impost being marked on the lower side by the capital of a jamb shaft, which starts from the abacus of the next capital below. The rail is supported by a die elegantly pierced with open Gothic panels repeated in blank on the dado against the wall. The screen, however, considering its functions, seems quite too heavy, and its details are coarse enough for exterior work. It is to be regretted that a constructor so skilful should not have availed himself of the opportunity for a lighter and bolder treatment, and given us perhaps a single ramping or flying arch for each run. The vaulted corridor by which the main entrance to the Court of Appeals is reached is lighted by a glazed arcade, opening on the court, and affords us our first salutation of color, — an ingenious symphony (shall we say) in red patterns upon a gold ground, the naturally varying nature of the gold in different aspects admirably illustrating the different inclinations of the vaulted surfaces, which are further separated at the angles of the vault by small gilded heads, a temperate but very effective enrichment. It is to be noted, as a fair example of the intellectual as opposed to the sensuous spirit, which has made its way into the best modern design, that the functions of each member of this simple architectural ordinance are recognized by some difference of treatment. Thus, as regards the walls, the eye is balked of its natu-

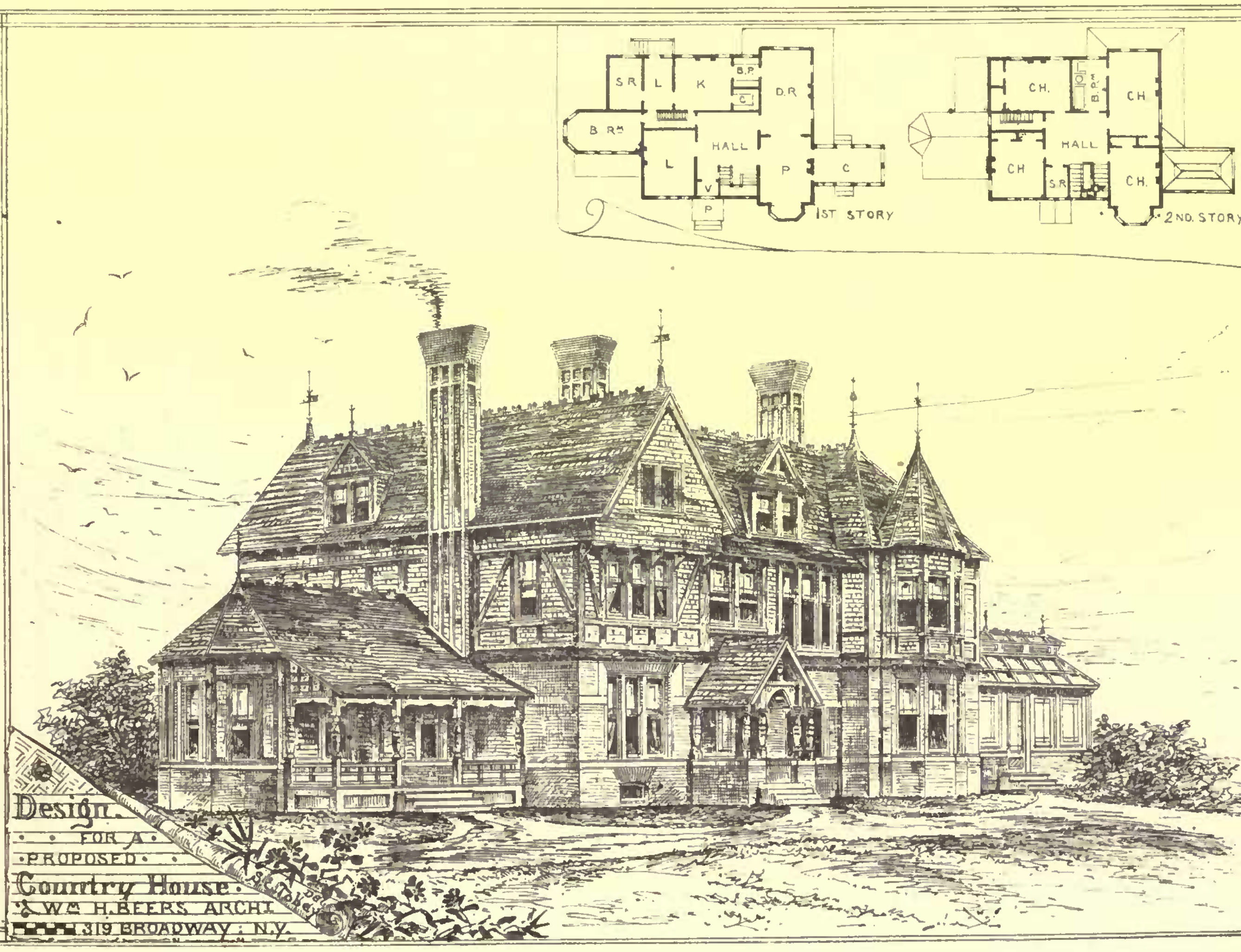


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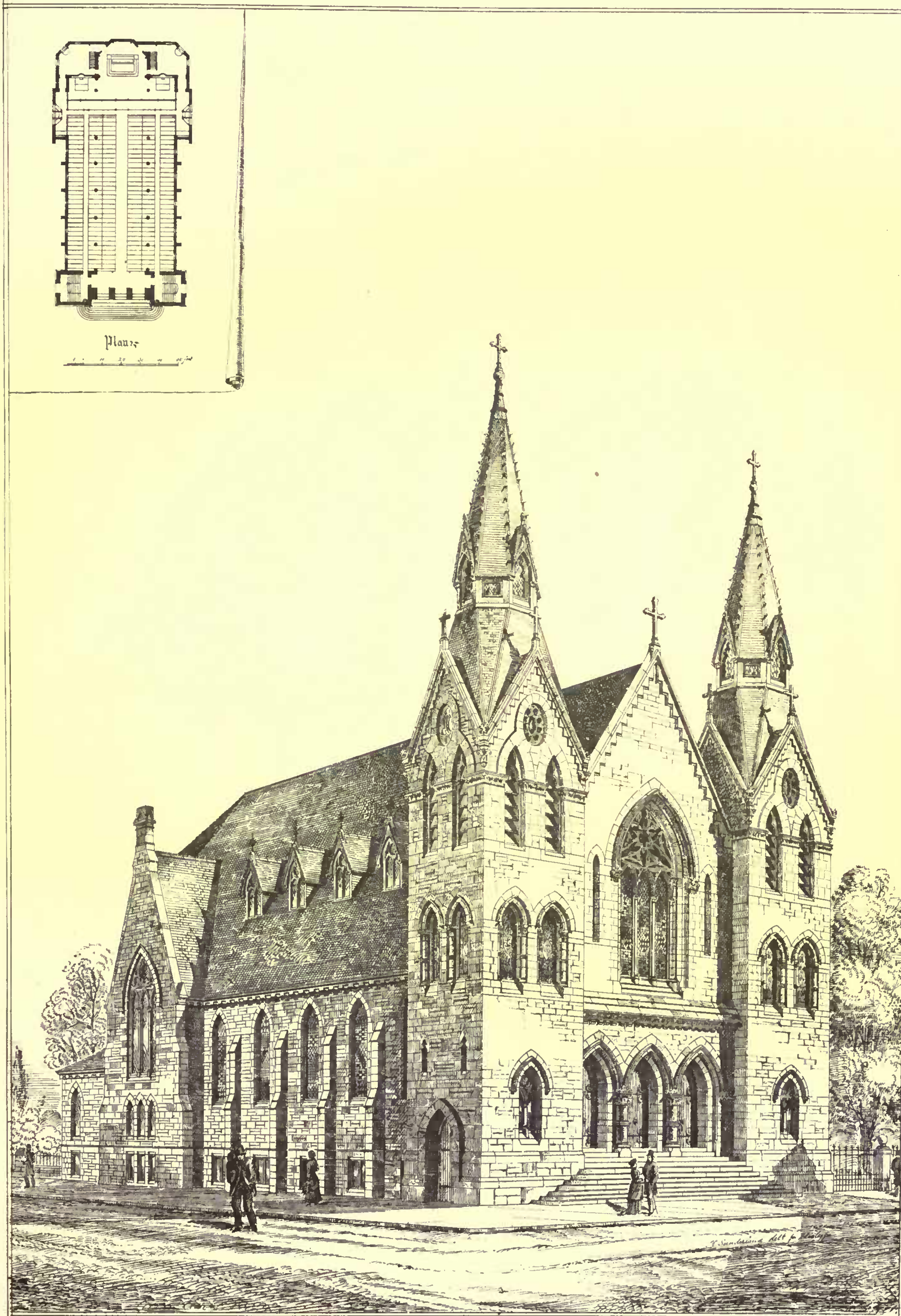


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ral, or perhaps inherited, desire to see certain of the belts of decoration upon the piers continued along the wall surfaces between, so as to bind the whole together. All such lines stop without ceremony at the internal angles, where also the belts of the wall surface experience a sensation of discontinuance ; but if the senses are cheated of their birthright in this manner, the intellect, which recognizes that the pier has a different service from the wall-veil, is expected to be moved by an emotion of gentle approval.

The Court of Appeals is a parallellogram in plan, divided by a screen of stone arches, with a flat ceiling arranged in coffers of oak elaborately carved ; the room is wainscotted some ten or twelve feet high in the same manner, with richly carved oak, having a wall treatment of red above. The light sandstone of construction appears in the window jambs and doorways, and the wainscotting is set flush with it. The color of the oak, with the red walls, makes a beautiful harmony of subdued richness. The carving is very abundant, very beautiful, and very real, and the draperies are large, rich, and ornamental in character. The carpet is crimson. The Gothic element, as a contrast to the classic, often is less here than elsewhere, but one inclined to criticise might object to the elaborate affectation of honesty in the truss-work by which the oak-encased iron girders are to the eye supported at their bearings. In the neighboring office of the Attorney General the corresponding iron girder, which by the bye is in every case a part of the original construction, is frankly gilded, with all its bolts and rough angle irons, and the floor arches which it supports are confessed in the decoration, which is simple and effective, although the portion of the wall surface above the impost line is too nearly equal in width to that between the impost and the dado, and too heavy in color. Perhaps the intellectual sensitiveness of the modern architect would have been better content if, in the case of the oak ceiling of the Court of Appeals, which in reality forms an impervious screen under the floor arches, it had been designed in open-work, to show that it was a screen, and not a piece of construction. The grosser professional sense, however, which loves it knows not why, may well be content with the show as it is.

The testimony of the countless throngs of ladies and gentlemen, on the night of reception, wandering through the solemn Gothic corridors, so monumental both to the eye and to the understanding, and entering these apartments so rich but so serious and comfortable, for all their color, was a testimony of undoubting delight and surprise. And well it might be, for so rare a feast has never been set before them on this side of the water. The greater, therefore, the offence of the wise but cunning Aladdin who rubbed his wonderful lamp with such bewildering effect. If it had indeed been a lamp of truth, these pointed arches, would they not have been changed to round, and these beautiful details, would they not have yielded somewhat of their mediævalism for the sake of the harmony which should prevail in a great monument of architecture ?

I propose in another letter to treat of the Assembly Chamber, which of course was the main object of interest. H. V. B.

THE ILLUSTRATIONS.

THE MUHLENBURG HOSPITAL, PLAINFIELD, N. J. MESSRS. H. EDWARDS FICKEN AND CHARLES H. SMITH, ARCHITECTS, NEW YORK.

THIS building, about to be erected as a cottage hospital for the Muhlenburg Society of Plainfield, N. J., will be, considering even the present low rates of labor and material, one of the most economical of its kind, finished as simply, yet thoroughly, as is compatible with its requirements and possible for the small amount expended upon it. There will be a cellar under the rear part of the main building, flooring of yellow pine in the wards and halls of the ground-floor, and double to both stories. Walls and ceilings of first and second stories will be plastered two coats, and all interior and exterior wood-work will receive two coats of paint. Bath-tubs, water-closets, range, boiler, pump, etc., are all included in the contracts, which have been awarded to responsible Plainfield builders for the total sum of $3300. The two chimneys shown on the wards will be of terra-cotta, hung from the roof. The ventilation of the building has received the most careful attention, especially in the wards.

PORTIONS OF THE DEVONSHIRE BUILDING AND OF THE MONTGOMERY BUILDING, BOSTON, MASS. MESSRS. CUMMINGS AND SEARS, ARCHITECTS, BOSTON.

Both of the buildings here shown are built of white marble relieved with belts, *voussoirs*, etc , of a bluish limestone. The drawing belongs to the series prepared by the Portfolio Club, others of which we have published from time to time.

DESIGN FOR A PROPOSED COUNTRY HOUSE. MR. WM H. BEERS, ARCHITECT, NEW YORK.

This house was designed to occupy a corner lot of 200 feet frontage, with a fine water view in the rear. The house is about 75 feet front. The first story was to be of brick with blue-stone finish, above the first story of timber, with roof and sides shingled. The first and second stories were to be finished principally in ash, and hall, dining-room, library, and billiard-room were to have ornamental hard-wood floors, the vestibule and conservatory being tiled. This house was to cost about $15,000.

CHURCH OF OUR LADY OF VISITATION, PHILADELPHIA, PENN. MR. E. H. DURANG, ARCHITECT, PHILADELPHIA.

This church is now building.

DESIGN FOR A COUNTRY HOUSE, PREPARED BY MR. MORRIS W. SMITH, NEW YORK.

A RETROSPECTIVE GLANCE AT SOME OF THE ARCHITECTURE OF THE FRENCH EXPOSITION.

III.

AFTER site and plan come execution, — architectural designs other than plans, and the way that those designs are carried out. The architectural design shown in the temporary buildings has been touched upon. The absence of the need of general effect or special architectural effect in them has been alluded to. Their fitness for their purpose is their greatest beauty. But when we come to the permanent building, that which is to do beauty service for the others, the monument, the record, the building built rather for beauty than usefulness, then certainly the highest degree of beauty is the highest degree of fitness. Here we have a right to look for beauty, and must certainly feel proportionate disappointment if we do not find it. The disappointment, wherever there is disappointment, must be exactly in proportion to the expectation. And the disappointment will be in proportion, not to a reasonable expectation, but to the expectations, however unreasonable, which may be engendered by the place, the people, the thousand and one elements that go to make up expectation definite and vague, reasonable and unreasonable.

It is pleasant to begin by praising. The workmanship — the way in which the design for the building has been mechanically carried out — is perfect. It is the perfection of neatness, — of close joints, of smooth surfaces, of good workmanship, of mechanical execution. Everything that they have been told to do, skilful workmen have done, and done admirably. I do not know that it is reasonable to expect very much more. In a few months, or even a year or two, there is scarcely time to tell all the workmen employed on so large a building a great many interesting things. Taking into account the shortness of time, the vastness of the works, and the architectural habit of our time, I suppose it would be only reasonable to expect in a building erected under these conditions no more than a dry, bald, drawing-board-architecture sort of look. If so, such reasonable expectation seems to me fully met and satisfied by the building in question. But if, in addition to such reasonable expectation, it is also reasonable to expect, if not interesting or beautiful or still less original design, yet a certain general grace, a certain beauty of effect, if not of detail, then I think such expectation is not very satisfactorily met by this building. Whether you take it from the Paris side or from the side of the Trocadéro, I am afraid we must say that it is very ugly.

It is made chiefly of bricks. [Bricks are not a very monumental-seeming material ; yet that apse of the transept of that old Romanesque church at Cologne is built entirely of bricks, and of very rough, dirty-looking bricks, and what a satisfying pile that is !] It is a building of the new school. Old forms are not forgotten, but they have become servants, not masters. They are made use of or their services are rejected at will. Only, when old servants are rejected, new servants must be provided to do their work. It is not such an easy matter to create new servants in a moment. All the beautiful details of Greek art, or of the art of any other period, were not born in a day, or of one mind. It is only necessary to attempt to design something to do the same work, to find out that they are results of the survival of the fittest. And if training servants to do necessary work is hard and takes time, that is as nothing to the time necessary to train servants to do work decoratively.

The west front, the façade on the Trocadéro, of the permanent building of the Paris Exhibition, looks like the façade of a Continental railroad station. It is a broad gable of a medium pitch, like the front of the Milan Cathedral, — an ugly outline on paper, redeemed in the Milan case by the crowd of details encrusting and hiding it, and the nearness of the only available points of view, which prevent your ever taking in the whole outlines at once, or ever really seeing the façade as it looks on paper, and is. Some flat panels, — they look about four inches deep, though doubtless deeper, — with round-arched heads, arranged like a group of lancet windows in an early English gable, the tallest in the middle and the shortest outside, attempt to diversify and architecturalize this front. They look like efforts to meet some conventional idea of what had better be done, — a poor policy. In this case the policy is not only poor, but is carried out in a poor way. The early English architects made the tallest opening or panel or lancet the widest, and the shortest the narrowest, and diminished those between in proportion to their height. Again, the line of the tops of their lancets and that of the gable are never parallel. In short, they possessed an architectural instinct. The French, and our modern habit, but too generally have substituted the drawing-board and like tools for architectural thinking or architectural instinct. The modern method is the quickest, but its results show the fact. They look as if no time or thought or, least of all, emotion had been expended upon them. And, without such expenditure, I do not see how we can expect them to excite interest or thought or emotion, that noblest and subtlest result of architecture, which alone is what raises it to rank with poetry and music, which alone makes it a fine art. And that is just the lack of

the Trocadéro façade of the building in question. And what is true of that façade is unfortunately rather true of all the exterior. There are two towers, something like the common Italian campaniles, one on each side of the main body of the building. They stand up something like the two smoke-stacks of a steamboat; and the big bulk of the building between them, with its rounding end toward the garden, is something like the round stern of a steamboat; even the gallery carried around it is something like the projecting guards of a lower deck. Such resemblances do not detract from the real merit of a work of art, in any but the lightest sort of minds, though they serve sometimes to help to convey an idea of a design. The one just named is mentioned with a further purpose. I have often admired the stern view of the just-passed steamboat and the fine balance and vigor of line of its two smoke-stacks; but I know that they, and all its parts, have their uses. They are made as they are for apparent, or, more interesting still, hidden reasons of need. I can find no reason of need for the two towers of the Paris Exhibition building. It is drawing-board architecture again. These and other *motifs* in the architecture of this building seem adoptions with no particular reason. They seem the expedients of a commonplace mind; not the action of a mind with courage enough to do no more than need be done, not the action of a mind too full with a faith or an artistic impulse to have room in it for anything but the utterance of the pressing necessities of the case.

It is a credit to much of the exhibition building, and specially to its workmanship, that the nearer you get to it the better you like it. But it is no credit to the building to be ugly from a distance. The perfect building is of course one that is beautiful and satisfies from a distance, and that is beautiful and satisfies on a nearer inspection. We suppose the Parthenon at Athens to have been such a building. And the most beautiful would be one that would be like some mountains, or some beautiful trees which have not only fine form but an exquisite foliage, of which we cannot tell whether we admire them most from near or from far points of view. However admirable a single feature in itself may be, it is still a great fault if it largely detracts from the good general effect of a whole building as an ensemble. The building in question does not abound in interesting details. The color which a piece of wall is painted is, however, a matter of detail. The portion of the exterior wall around which the colonnade or outside gallery is carried is painted a Pompeian red. This looks well from near by, and the white columns of the gallery look prettily relieved against it. But, of course, in the shadow thrown by the colonnade roof, this color looks almost black at a distance; that is, it looks like unlighted space, or as the voids in a building look. The result is that from a distance the mass of the building seems to stand upon nothing, or, worse yet, to rest on the columns of the encircling gallery, which thus appear tiny and belittling. This is, however, an error in judgment, it is not a lack of design, it is not drawing-board architecture; it is only good design out of place. But, again, a matter of detail may be in place, it may be thoughtfully employed, it may be even necessary from a constructive point of view, and at the same time it may be very difficult to treat it satisfactorily. That palliates, excuses, even, the short-coming of the architect if he fails to treat it so that it does not injure the appearance of the building; but not the less does his failure result in a fault in the building, however unavoidable. Thus, attached to the main wall of the building, and placed at intervals around the apse-like end, are a number of projections which are carried up to the top of the building and finished out in a rather imbecile way. They look about a yard square each, or less, but I suppose they are as big as small towers. But, though a certain amount of thinking and architectural experience may lead one to conclude that they are useful and why, yet they do not look so. To most people, I think, they must look neither useful nor ornamental, but intended to be the latter. Their great look is the unmeaning and commonplace look. But Gothic buttresses do not look unmeaning, even to those who do not fully understand or think or care about their use. They do not look unmeaning, however plain, nor yet however elaborate they may be. Neither do the counterforts of a retaining wall of a bank of earth look unmeaning or commonplace. They look in place, and needed in that place. Not conventionally in place, but necessarily in place. Not an unmeaning commonplace, but a meaningful though common need is called to your mind.

AN ATTEMPTED RESTORATION OF A HYPÆTHRAL TEMPLE.

[We translate from the *Encyclopédie d'Architecture* the following memoir read by M. Charles Chipiez, Académie des Inscriptions et Belles-Lettres, December 28, 1877.]

II.

It is now time to consider whether monuments and texts justify the employment of the methods which we have used to complete the temple.

Observations made at Ægina by M. Garnier upon this same building make the existence of two openings in the roof very probable. These were observations of the upper and lower columns of the colonnades of the cella. The former are in monochrome, while the clear and even tone of the latter is violently relieved by lines of strong red which mark the arrises of the flutes. Recurring to our perspective view, it will be seen that it was absolutely necessary that it should be so. The columns, lighted by a cross-light, would offer to the spectator placed in the axis of the temple but a vague and feeble outline, if strongly pronounced lines did not reëstablish the firmness of the contours. This subtle artifice, wholly characteristic of Greek refinement, is wholly explained by a bi-lateral lighting.

The construction of the inner colonnades seems otherwise to confirm the perforation of the roof. It appears from the ingenious observations of M. Choisy, that the Greeks placed their stone according to the nature of the force to which it was to be submitted; the courses, as they were to resist compression or flexure, were placed upon their quarry bed, or at right angles to it; in other words, the layers of the stone were, in the first case horizontal, in the second vertical. The application of these principles of construction is manifest in the great temple of Pæstum. The architrave of the lower order in the cella of this building is placed upon its quarry bed, for intelligible reasons; otherwise there might be fear of its being crushed between the capitals of the lower columns and the shafts of the columns above; while there was no danger of its giving way between the supports, either from its own weight, or from that of the thin flags of the intermediate floor. The architrave of the upper order, on the contrary, is placed at right angles to its quarry bed, that is, with the stratification vertical, thus showing that it had to resist flexure, a considerable weight to support between the columns. With what heavy mass, other than the roofing of the cella, was it possible to load it? Upon this architrave are overlapping slabs ornamented with a beak-moulding, which is repeated upon the walls, and encloses the space that we have assigned to the openings in the roof. This is a detail the more remarkable in that the lower architrave is profiled upon those of its faces only which look upon the interior of the cella.[1] Such arrangements make a break in the roof over the side aisles of the cella not only possible, but probable.

In all the restorations of hypæthral temples which have hitherto been submitted, the water from the roof falls partly outside, partly into the cella, to the floor of which it is led by earthenware pipes. Without concerning ourselves about the offensiveness of rain-water conductors to students of Greek monuments, it may be remarked that the most minute investigations have not discovered, among the enormous quantities of ceramic fragments that have been brought to light, any that could lend itself to this service. Moreover, the floor of the cella never bears traces of arrangements made for the disposal of rain-water. These circumstances seem singularly to support the method with which at the outset we have directly carried the rain-water outside the temple. We could multiply remarks of this kind if our attention were not called to a rapid analysis of the texts.

It would be inappropriate to discuss features peculiar to the Roman temples. A fundamental distinction has justly been established between the hypæthrum of these buildings, destitute of inside colonnades,[2] and that of the Dorian temples. Varro, Ovid, Lactantius, Festus, and Servius may then be passed by.

Of all ancient authors, Vitruvius alone has described the arrangements of the Greek hypæthrum: "Hypæthros vero decastylos est in pronao et postico; reliqua omnia eadem habet quæ dipteros, sed interiore parte columnas in altitudine duplices, remotas a parietibus, ad circuitionem, ut porticus peristyliorum. Medium autem sub divo est sine tecto, aditusque valvarum ex utraque parte in pronao et postico. Hujus autem exemplar Romæ non est, sed Athenis octastylos, in templo Jovis Olympii."

M. Beulé thus translates this paragraph: "The hypæthral temple has ten columns, both in pronaos and in posticum. It is like the great temples whose outer colonnades are double, excepting that in the interior of the cella it has two rows of superimposed columns, separated from the walls, and, like the colonnades of the peristyle, leaving passages for circulation. The space lying between the two interior colonnades is open, and without roof; there are doors on each side, both in pronaos and in posticum. In Rome, we have no hypæthral temple; but there are several in Athens, with eight columns in the façades; for example, the temple of Jupiter Olympius" (or, with the conjunction *et*, "also the temple of Jupiter Olympius"). "So important a passage," M. Beulé then remarks, "was unhappily found to be inaccurate, and the various readings contradict each other. What do these ten columns in posticum and pronaos signify? Why are the only examples cited by Vitruvius exceptions to the rules laid down by him? Are these doors on each side of the usual doors in front of the cella, or side doors like those at the temple of Jupiter Olympius at Selinus, intended solely for the use of the multitude? What are these temples with eight columns mentioned by Vitruvius? The Parthenon? But there is here an opisthodomus which assuredly did not serve as a passage for the multitude, since it contained the public treasure. The temple of Jupiter Olympius? But this has more than eight columns on the façade. The temple at Olympia? But this has only six. The uncertainties are numberless, and lead to nothing. We must then wait for a better understanding of the text."

The ambiguous description of the Roman author is a sufficient indication that he had not seen the hypæthral temples of Greece; he might be said to have taken it from scattered data, selected from writers. From this point of view, it offers a peculiar interest. Assuming that Vitruvius has united in a theoretical example arrangements borrowed from different temples, we are able to explain most of his deductions.

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[1] A. Choisy, *L'Art de bâtir chez les Romains*, pl. xxiv.

[2] The cella of the temple of Jupiter at Pompeii is an exception to this rule.

If we set aside the question of decastyle or octastyle porticos, which by our theory is stripped of all importance, we immediately confront two easily intelligible directions.

The light must enter by the open roof, *sub divo*, which agrees with the assertions of various writers. Ὑπαίθριον, ὑπό τ' ἀέρα, says Hesychius in a short comment. The cella, too, must be divided by columns; this arrangement is in no wise imaginary; all archæologists know that the interior of several Doric temples was divided into three aisles by means of superimposed colonnades. Finally, doors are necessary in the walls of the pronaos and posticum; here, the monuments contradict the text; the grand entrance of the temple is not ordinarily repeated upon the wall separating the cella from the opisthodomus.

Are lateral doors referred to? Let us examine this hypothesis. In attributing to the ideal type of the hypæthral temple a decastyle arrangement, Vitruvius, from this very fact, has in mind a larger building than the Parthenon. It is much less extraordinary to suppose secondary entrances to an interior of such exceptional importance, from the fact of a similar peculiarity being often reproduced in Greek architecture. The propylæa, for example, which are in some sort the vestibules of temples and which repeat the lines of their façades, are more or less pierced on each side of the principal door,[1] which is elsewhere plausibly explained by the necessities of circulation. We do not know the reason of a similar arrangement in certain sacred buildings.

According to Pausanias, openings placed in the axis of the porticos were sometimes contrived in the wall at the farther end of the cella. This same author makes known that the temple of Jupiter at Olympia had several entrances: "Over the doors of the cella." says he, "is to be seen the boar hunt of Erymanthus;" and farther: "Entering the bronze doors, you see on the right a column against which Iphitos leans with his wife Ecechiria." Two doors have been observed in the pronaos of the temple of Jupiter Panhellenius at Aizani, in Asia Minor; and traces of two entrances are still to be seen upon the façade of the great temple at Agrigentum. Finally, what is conclusive, the temple of Jupiter Olympius at Selinus had lateral doors upon the wall of both pronaos and posticum.

If such were the case with the canonical type of the hypæthra, the roof-openings and lateral doors in the cella walls are strictly correlated in the text of Vitruvius, and hence the signification of the *medium sub divo est sine tecto* is very different from what has always been attributed to it. Let us resume M. Beulé's translation, modifying it in consequence. "It has two rows of superimposed columns in the interior of the cella separated from the walls: and, like the colonnades of the peristyle, leaving passages for circulation. *The space lying between the walls and interior columns* [and not: The space lying between the two interior colonnades] is open, and without roof; there are doors at each extremity, both in pronaos and in posticum."

The plurality of doors, examples of which might be multiplied, singularly lessens, it will be seen, the main difficulty of this paragraph; to our mind, it can also be inferred from it that the canonical arrangements of the hypæthra admitted of two openings in the roofs of those temples whose cella was separated by columns, and that these openings occupied the space between these columns and the walls of the cella.

A passage from Justinius supports rather than invalidates our system of restoration: —

"When the Gauls," he says, "menaced the temple of Delphi, the Greeks imagined they saw Apollo decend from the sky and pass into his temple — *per culminis aperta fastigia* — through the openings of the roof."

Other texts, often cited, and whose importance we have no wish to exaggerate, also bear upon our subject.

According to Pausanias, the lightning struck the pavement of the temple of Olympia when Phidias entreated Jupiter to indicate his approval of his statue. This is indirect evidence that the roof of the temple was open. Strabo makes the following remark upon the Jupiter of Phidias: "The god, although represented seated, almost touched the ceiling with his head, and one could not help thinking on seeing him, that, if he were stretched out to his full height, he would have lifted the roof from the building." From the passage of Pausanias, we were obliged to conclude just now that the temple of Olympia was open. Strabo shows us that this building was also covered in its central part. I well know that we might suppose a Jupiter Olympius to be placed in some kind of niche; but this arrangement would leave a trace upon the plan of the temple. The latest investigations of which the temple at Olympia has been the object have discovered nothing which justifies such an arrangement as this.

There is such agreement between these texts and our restoration that we think it useless to adduce certain arguments that a small number of inscriptions might suggest.

If our demonstration is clear, it should be proved that the Doric temple with interior columns was covered and lighted. The methods we have suggested for giving access to the light, and which it behooved each builder to proportionally modify, result from the very plan of the temple; the structure of the building itself proclaims them; these methods are simple, and, in our opinion, in accordance with the spirit of Greek architecture.

[1] This is the case with the propylæa at Athens and Eleusis.

THE SEWERAGE OF NEWPORT.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Your inquiry as to the probability of a proper system of sewerage being carried out in Newport would have been answered long ago had it not been desirable to await the final action of the city council upon projects then under consideration.

The subject has been discussed for several years, and the recent introduction of a public water-supply has of course emphasized its importance. Some months ago the committee having the matter in charge let it be understood, in a non-committal way, that they would be glad to receive suggestions concerning a plan: subsequently they invited Professors Wm. B. Rogers, Fairman Rogers, Josiah P. Cooke, Wolcott Gibbs, and Alexander Agassiz, and General G. W. Cullum to act as an advisory commission and suggest the general features of a plan.

These gentlemen gave the subject their careful consideration and recommended that the sewage be discharged at the west side of Coaster's Harbor Island, or beyond the breakwater of Goat Island. Mr. Philbrick and I selected different points of outlet on Coaster's Harbor Island. Dr. Storer suggested an outlet at Castle Hill. The four reports contained, it is fair to say, material upon which an intelligent committee, aided as they would have been by the gentlemen above named, might have organized a system which it would have been worth while at least to consider, and which, if of no other value, would have served as a starting point for profitable discussion. The cost of this would not have exceeded $500, and it would have secured a most important step in advance.

The action finally taken was to present to each person who had reported on the subject a printed copy of a resolution of thanks passed by the council, attested by the gold seal of the city. *Et voi à tout!*

It is absurd to suppose that a community ruled as this is will tax itself for the building of sewers until after it shall have lost, for the want of good sewers, — and of the reputation which these would give the town, — lost, that is, by disease and death, and still more by the rumor of them, several times the estimated cost of the work.

Like all other towns we are governed by the majority; perhaps more than the average of towns, by a majority which is careful in the matter of taxes, and more doubtful as to the propriety of new methods. In many ways this is advantageous, but on any question of sanitary improvement it is fatally bad. We have already spent more for bad sewers than the complete proper drainage of the whole city would cost. We shall probably again waste in patchwork — of little ultimate value — more than a complete system would cost.

Our sanitary condition certainly is not now above reproach. Our public water-supply is largely derived from a gathering ground manured with night-soil, which, in at least one instance, has been copiously spread to within ten feet of the main stream and near the supply-pond only a few days before a heavy rain-fall. The majority of the people depend on wells which are in close proximity to cesspools and which analysis has frequently shown to be tainted with sewage matters. Such sewers as we have discharge mainly into the still water of the inner harbor. Our household wastes are carted through the streets in broad daylight, in stinking carts, and in many respects the usual characteristics of small fishing-towns prevail. Still, however triumphant our development of stench may become, it is not likely that the condition of the public health will be greatly affected thereby. We have a sea-side atmosphere in almost constant motion, and infection is not here likely to make its assault through the medium of the outer air. Our danger, such as it is, relates to the accumulation of the worst forms of filth in the soil and in its water-bearing strata, and to the foul oozings into our cellars. With an increased use of water, these conditions are rapidly growing more serious. No complete remedy for this trouble has yet been devised except complete, universal, compulsory sewage, accomplished by means of the best appliances of the art. This we shall not have for many years to come.

The sewerage discussion has not been without its amusing incidents: for example, a grave and learned-looking editorial in one of our papers, a few days since, compares our conditions — with the whole of Narragansett Bay to receive the sewage of 15,000 people — with that of London, where the offscourings of a population of over 4,000,000 is poured into a little river whose discharge is obstructed by a tide of some thirty feet, — the heavy salt water of the flood burrowing under the fresh-water outflow and carrying upstream the foul matters deposited in its bed.

Our own problem is really an extremely simple one. It will be at most a question of carrying our outlet far enough out into the bay to reach the main sweep of the tidal current. My own notion is that sewage delivered at the upper end of Coaster's Harbor Island, and moving southward only when the water is flowing out from both arms of the inner harbor, will become so diffused in the enormous preponderance of salt water, that the little which will return and be drawn into the harbor with the inflowing current will be inappreciable, — practically nothing as compared with what we are now delivering there.

If your interest in the matter is based on a desire to know whether you can safely recommend Newport as a residence for your friends, you may consider that, on the whole, our advantages exceed our disadvantages, and that an intelligent person may so regulate his life

here as not to suffer from the obvious and increasing sanitary defects of the place. Geo. E. Waring, Jr.

Newport, R. I., January 6, 1879.

PUBLICATIONS RECEIVED.

The Ghiberti Gates. An Account of Lorenzo Ghiberti and the Bronze Doors of the Baptistery at Florence. By Mrs. Julia A. Shedd. Boston: Houghton, Osgood & Co.; The Riverside Press, Cambridge. 1879.

NOTES AND CLIPPINGS.

Houses for Workingmen. — The Chicago *Tribune* mentions a building scheme which the Union Mutual Life Insurance Company propose to carry out upon some of their vacant property in the southern part of Chicago. The plans are the work of Messrs. Wheelock & Clay. The problem of building houses in a continuous block, and yet having, to a great degree, the appearance of isolation, is accomplished by a double court in front between each pair of houses; this feature, besides giving ample light and ventilation to all interior rooms, affords the architects an opportunity of displaying considerable variety in the treatment of their designs, not only of the exterior, but of the interior. The courts in the rear are quite similar to those in front, leaving only a short line of party-wall between the two houses. As the courts are thus in pairs, they give double the amount of light, and yet the windows are so arranged that it is impossible to see from one into any other. Also, by an ingenious arrangement of the staircase in each alternate house, the front entrances are entirely separate and come in regular succession. These houses are to be of two stories, with cellar and attic: in the cellar are the laundry, furnace-room, storerooms, etc. Each house has a parlor, hall, and staircase-hall, dining-room, kitchen, etc., upon the first floor; part of them have a library in addition, all well lighted and ventilated. The main stairs are at the rear of the parlor, and not exposed to view upon entering or leaving the entrance halls, which are to have tile floors, open and unobstructed.

The Lee Monument. — The Lee Monument Association, chartered by the Legislature of Virginia for the purpose of building in Richmond a monument to General Robert E. Lee, proposes to take up on his birthday — the 19th of January — a collection throughout the South in aid of its undertaking.

The King Bridge. — Professor Vose having declared the King Bridge Company's bridge in Bath, Me., to be unsafe, the company challenged him to a test, agreeing to pay for the damage to the structure should it give way, and proposing that otherwise the professor should pay for the expense of the test. Professor Vose accepts the test, and says: "This test must, of course, be conducted by disinterested persons, not by the King Bridge Company nor by me. Let us appoint three iron-bridge experts, one to be chosen by the King Bridge Company, one by me, and these two to select the third; or let the American Society of Engineers appoint all three. Let these men first decide what the contract means when it says the bridge is to hold 2240 pounds per foot. Let them see that the actual amount is put on, and measure the deflection during the loading, and see how far the bridge recovers itself when the load is removed. Let the experts measure the bridge and estimate the strain on the various parts. If the bridge does not fall, the experts are to say whether any part has received permanent injury, or has been strained to more than the safe amount."

Honors to Americans. — *Le Moniteur des Architectes* states that a Mr. Lindsley of New Haven, Conn , has obtained the Prix Mulher-Jœhnée. It is also a matter of common report that Mr. F. D. Millet, a Boston artist, and during the Russo-Turkish war a correspondent of the London *Daily News*, has been decorated by the Czar with the order of St. Stanislaus.

Liverpool Docks. — The landing-stage and all the dock estate on both sides of the river are owned and administered by a body known as the Mersey Dock and Harbor Board, which also controls the pilots, and assesses and receives all dues of the port. It consists of twenty-four members, all of whom are honorary in their capacity; four are nominated by the Conservancy Commissioners of the Mersey, and the other twenty are elected by the dock ratepayers. Despite the variety of the interests involved and the immensity of the trust, no scandalous charge has ever been brought against the administration, which is solely for the benefit of the port and the country. The value of the estate is about one hundred million dollars, and the income is about five million dollars annually. The docks extend for more than six miles in a continuous line, and comprise about four hundred and twenty acres — two hundred and fifty-five acres, with eighteen miles of quay margin, being on the Liverpool side, and one hundred and sixty-five acres, with nine miles of quay margin, on the Birkenhead side of the river. The total quay margin alongside of which ships can be moored is twenty-seven miles, and every quay is built of solid masonry, granite being the commonest material. The dry or "graving" docks, also, are formed of masonry, and a large iron steamer inclosed in one, with her Titanic proportions fully revealed, is a sight to remember. The quays are all covered by substantial sheds or warehouses, those of the new corn dock being ten stories high, with a cellar below the water-level. The corn is conveyed from the vessel by hydraulic machinery into the cellar, which is rat-proof and water-tight, and thence it is raised by an elevator, at the rate of ten tons a minute, to the parts of the building prepared for its storage, the capacity of the warehouses being about one hundred and sixty-five thousand quarters. — *Harper's Magazine.*

Cruikshank's Drawings. — Drawings and sketches by Cruikshank were lately sold in London at moderate prices. A collection comprising 165 lots went for about $1,800, and included many humorous studies dating from the years when the artist was at the height of his powers, besides several rare etchings and engravings. Among them were some of the original illustrations to "Windsor Castle," "The Court of Queen Anne," and "The Comic Almanack."

Subterranean Telegraph Wires in Germany. — In 1876 the first subterranean telegraph wire was laid down in Germany. Recently, subterranean lines have been completed from Berlin to Cologne, from Cologne to Elberfeld and Barmen, from Frankfort to Strasburg, and from Hamburg to Cuxhaven. Altogether the length of these lines now amounts to 1,554 English miles. Most of the cables consist of seven wires, very few of four only. The difficulties encountered in laying down the cables in marshy or rocky ground, along the streets of large towns, across, or rather under, rivers, and through fortifications, have all been successfully overcome. Next year six other lines are to be laid down, and then the projected system of subterranean telegraphic communication throughout the German empire will be almost complete. The cost of the lines already laid down amounts to about $3,039,000.

Recent Improvements at Rome. — An exchange says: "The improvement of the Roman Campagna has been long talked of. While talk is likely still to continue for some time to come, there is encouragement in the fact that a bill has just passed the Chamber of Députies, by a majority of 126 in a house of 239 members, which is intended to further such a scheme. The report on which the bill is based points out that it will be necessary, in order to render the lands healthful and fertile, to subdrain the soil so deeply as to reach the bottom of the tula formation, for the purpose of getting rid of the subterraneous water, and at the same time to provide a system of irrigation for the surface. The extreme undulation of the surface would make it necessary that the canals supplying such irrigation should be exceedingly long and tortuous. It is further remarked that the enormous masses of water which were poured into ancient Rome by the old aqueducts became, when the population was greatly diminished and the aqueducts went to ruin, a means of saturating the subsoil with water which there was no normal means of getting rid of. Added to these causes, there are the frequent inundations of the Tiber; the vast superficies of the Pontine and other marshes; the peculiar nature of the coast for about 120 miles, which renders it especially liable to infiltration; the low level of the neighboring plains, in some places absolutely below that of the sea level; and lastly, the mixture of stagnant or fresh with salt water. The opinion is expressed that the malaria is the product of the locality where it exists; that people tread upon it with their feet; that it does not diffuse itself to great distances from its sources, and that it does not rise to any great height from the soil. It is proposed in the bill just passed that all the proprietors of lands within the zone to be improved be obliged to undertake cultivation to a high degree (*la colura intensira*), their taxes for such lands being remitted and a Bank of Agricultural Credit being established for the payment of premiums to such persons as shall best prosecute their work. This bank will also lend money, and establish a model farm. It is intended that the twenty ancient roads which traversed the Campagna in former times shall be retraced and supplemented by as many cross roads as may be needed to render every portion of the area to be operated on easily accessible. And 'if the Roman legions constructed the ancient roads in great part, no one would see any objection to the employment of the army in so urgent and necessary a work.'"

An Old Street gone. — In completing the Boulevard St. Germain, one of the longest thoroughfares on the left bank of the Seine, in Paris, it was found necessary that several interesting and noted houses in the Rue de l'Ancienne Comédie should be destroyed. This ancient street is only 150 yards long, but it has been inhabited by many persons of celebrity. In the house No. 2, which was built 300 years ago, lived for many years Dr. Guillotin, the inventor of the famous instrument of capital punishment in France. No. 5 was inhabited by Cambaceres, the High Chancellor of the First Empire, who died there in 1824. Horace Vernet, the painter, and Baron Gros at one time had studios at No. 4.

A Novel and Simple Method of taking Specific Gravities. — M. Gannal has recently devised a means of determining exactly, and with the greatest facility, the specific gravity of all liquids. With his "*densimètre hydrostatique*," all calculation is obviated, and the specific gravity is ascertained by simply reading the weight on the balance. This useful and ingenious apparatus is made in the form of an olive, so that bubbles of air shall not attach themselves to its sides. The olive (whether made of glass or metal) has a volume exactly equal to one decimal subdivision of a cubic metre. There are two different methods employed in the practical use of the apparatus: First, we may suspend it on the platform of the balance, and after having produced an equilibrium we plunge it into the liquid; the equilibrium is then destroyed by the loss of weight of the olive, and the number of grammes which it is necessary to add to the scale pan to restore the equilibrium is the exact specific gravity of the liquid. Second, or we may equally well adopt the following plan: We put the liquid whose specific gravity we desire to ascertain in a glass vessel on one pan of the balance; we balance the scale pans, and then suspend the olive in the liquid by means of a fine thread. The equilibrium is destroyed, and the scale descends on the side on which the olive is suspended, and the weight which it is necessary to place in the other pan to restore the equilibrium is equal to the specific gravity of the liquid. This apparatus will determine the density of all liquids, whether they be heavier or lighter than water, whether they be acids, alcohols, or syrups. It advantageously supersedes the areometers; it is not fragile, and it gives the indications with an exactitude depending on the sensibility of the balance employed. The work is reduced to a simple weighing and reading of the weights on the balance M. A. Gannal has constructed instruments of one hundred cubic centimetres, and ten cubic centimetres only. The larger apparatus is the one which will prove the most convenient and the most needed in commercial and industrial determinations. With this instrument, and a balance sensitive to one decigramme, we may determine the density to the thousandth degree. — *Les Mondes.*

The Streets of Omaha. — It was intended that Omaha should be a beautiful city, and one means to that end was to give most of the streets a width of a hundred feet. It is found, however, that such streets are inordinately expensive to grade, pave, and keep in repair, besides being troublesome, and the common council is considering a proposition to make them narrower.

The American Architect and Building News.

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CONTENTS.

We said briefly in our last number that the Washington Monument Commission had decided to recommend Mr. Story's design to the Congressional Committee on Public Buildings and Grounds. What the chances of its adoption are we do not know, but considering the wide-spread and acknowledged dissatisfaction with the present design, and the reputation of Mr. Story, it is natural enough that his design should carry the day. Now, however, that the Commission has so far yielded as to give up its adherence to the first idea, it is desirable, before the question of form is decided beyond recall, to make sure that the best thing is done that can be done, and that the authorities should not jump inconsiderately from one *parti pris* to another. Mr. Story's design, of which we have before us a large photograph, is incomparably better than the thing it is intended to supplant, and has many merits, but is on the whole disappointing; and it would be a mistake to adopt it without first finding out whether some one else had not a better thing to offer.

Mr. Story has encased — with marble, we presume — the shaft of the monument, so that the work now done disappears completely in his drawing behind the vertical walls of an Italian campanile. The shaft is carried up to near three hundred feet, and capped with a pyramidal roof which rises to three hundred and fifty, and is crowned with the winged statue of Fame, of which we have heard. The first hundred feet and more of the tower (which is a little more than fifty feet in diameter) is widened into a square lower story, or die, which projects enough to give a gallery about six feet wide around the shaft. Against the faces of this die stand the four porches, a hundred feet high, each carried on two pairs of detached columns, and containing, we suppose, a niche like that shown in front, over which is a gable, and on this perches an eagle. The statue of Washington, twenty feet high, is shown on a tall pedestal in the front niche. Just above the abutting ridges of the four porches is the bold cornice of the die, crowned by a light overhanging balustrade. The spandrels over the porch roofs are ornamented with raised panels carrying figures of Victory in relief. Above the die the corners of the shaft are reinforced by octagonal buttresses or turrets, like those on the campanile of Florence; it is cut horizontally into three divisions, each with its cornice. The lower story, which shows only about twenty-five feet above the gallery of the die, carries two blank arches on pilasters, and between them a rectangular panel. The arches are divided by single columns, supporting the usual Italian substitute for tracery, — two sub-arches with circle between. The next and middle division is more than a hundred feet high. The wall is occupied by three high blind arches carried on very slender twisted shafts, the openings divided by thread-like sub-shafts, and the heads filled with the same tracery as the two below, but the panels are divided at mid-height by a broad belt that encircles the monument, and the traceried heads are repeated under it. The third story is a kind of blind belfry-stage, thirty-six feet high, decorated with a classic order on pedestals in three intercoluminations of engaged columns, which are filled with blank arches and the same kind of tracery and sub-shafts as those below. The cornice is *quasi* machicolated, that is, has a round arched corbel table under the corona, and above it is a blocking course or stylobate filled with a slender, blind balustrade. Out of this rises somewhat abruptly the pyramid of the roof, its sides cut into plain panels relieved from a sunken ground, and its top wrought into an octagonal pedestal, on which is balanced the statue of Fame.

It is somewhat hazardous to criticise a design from a first sketch, which may be subject to great alteration and amendment in execution; but Mr. Story has frankly spared the Commission this difficulty by presenting them what is not a sketch but a finished drawing, worked out with great care and drawn with precision in every detail, so that we may assume it to have been completely studied. The first impression of the design is dignified, tranquil, gentlemanlike, and even elegant. Its silhouette is agreeable as shown in the drawing, though a little hunched at the junction of the first story and the shaft, and somewhat wanting in firmness at the base. Some of its faults, we fear, would appear more evident in a perspective or angular view, a view in which, we may guess, Mr. Story has not studied it. The main idea, that of treating the monument after the fashion of a campanile, is not a bad one, and had been suggested by many people, among them by General Meigs and by Mr. Hill. As we said of Mr. Story's first suggestions, the difficulty was in carrying it out to avoid the commonplace. Here, it must be confessed, the effect is on the whole mechanical and mediocre; the different divisions of the design are not very successfully adjusted; the detail is at the same time monotonous and inharmonious. The group of porches around the base, and the square section which they surround, which we have called the die, do not seem adequate to the support of the shaft, which is too massive to be thrust out of a slight balcony; nor yet are we made to feel that the shaft is independent of them, and lifts itself firmly from the ground. There is a little quarrelling between lightness and massiveness, which the pains Mr. Story has taken to break up the surface of the shaft has not altogether appeased, while it has sensibly diminished the majesty due to a tower three hundred feet in height, and would probably prevent the monument from ever looking as large as it would really be, — a thing that we should suppose would be in the eyes of the Monument Commission the unpardonable sin. There is also some conflict between the upright and the horizontal lines, to reconcile which is always the greatest single difficulty in such a design. Mr. Story has successfully kept his horizontal lines predominant at the base, and the upright ones in the shaft. The curve of the archivolts of the porches and the climbing lines of the gable are the middle terms which help to unite the two elements; but their union is frustrated by the sudden interposition of the most vigorous horizontal feature of the composition, the gallery at the top of the die, with its bold cornice, its violent shadow, and its overhanging balustrade, thus a second time interfering to mar the junction of the two parts. This is to our minds a cardinal error.

The division of the shaft itself is not very happily managed. The lower story of it is too low, and its arcading too delicate to be the support of the story of a hundred feet above it. In most positions in which the monument would be seen, — in all in which it would be studied, — only the upper part of these arcades would be seen, peering over the balustrade which surrounds them. The transition from a double to a triple division between this story and the next is not agreeable. The belfry-stage, too (we do not know what else to call it, though it is solid), which should be the predominating feature of the shaft, is low and unimportant. Its machicolated cornice is not enough to give it ascendency over the main division below, which ought to be the point of repose of the whole mass, but is so treated as to force itself on the eye and dwarf the upper division. This effect is increased by the sudden and unexpected way in which the pyramidal roof, in itself very well proportioned, is dumped (there is no other word for it) upon the blocking-course that surmounts the final cornice. The belfry-stage is of the full diameter of the tower, and there is no retreating attic above it, as in the Campanile of St. Mark's and in Palladio's beautiful Venetian towers, to prepare for the pyramid, which, therefore, finishes the composition abruptly, and on an angular view must necessarily look shrunken and too small for its position, while even in combination with the belfry-stage beneath it does not make an adequate termination for the monument which it surmounts.

The abundant detail of the design is a mixture of modern classic and mediæval Italian. It is treated with refinement, but the difficulty of the fusion is indicated in its imperfect success. The porches are carried by a somewhat freely treated classic order of Corinthian proportion and composite detail. The high attic above this carries a frieze decorated with a flat corbel table, such as we see in North Italian terra-cotta work, and a Corinthian cornice considerably bolder than that below it. The slender detached columns would seem, we fear, to be overwhelmed by the entablature and heavy attic they carry, which are so treated as to combine into a sort of compound entablature as heavy as that of the proto-doric order. The walls behind the columns, the niche, and the face of the attic are covered with an inlay of square-headed panels in colored marble, like those in the clerestory of the cathedral at Florence. Over the heavy cornice of the lower division the plinth, rail, and sparsely distributed dies are of the ordinary Renaissance form, but the balustrade between them is an extremely slender arcade, such as we see across the front or under the eaves of some early Italian churches, at Assisi or Parma for instance. The detail of the lower story of the shaft, pilasters, arcade, panelling, engaged columns, and all is the regular Renaissance. In the story above we have the attenuated spiral jamb shafts and cobweb mullions of Florentine twelfth century work, a belt of lozenge-shaped panels with quatrefoils in the middle, and an inlaid frieze under another Corinthian cornice. The belfry stage again is pure Renaissance, except for a second inlaid frieze and the machicolations of the cornice, and the slender shafted balustrade, this time without the arched heading, reappears engaged in the continuous die of the blocking-course under the pyramid.

Mr. Story's skill, or that of the architect or architectural draughtsman who, we may suppose, has carried out his directions, has not succeeded in harmonizing these discordant elements. The hand that adjusted them was inexperienced or weak, and the task very difficult. The wire-drawn detail of the mass of the shaft does not fulfil the office of the exquisitely delicate but spirited decoration which enriches without disturbing the broad divisions of Giotto's tower, but it does away with the simple vigor of the Venetian campaniles. Nor is it reconciled with the pronounced classicism of the rest of the detail by the inlays and balustrades and corbellings that are distributed over the design. If there were less at stake it would seem ungracious to criticise with this minuteness a design which is so superior to that which it aims to supersede. But the building of such a monument is, with the exception of the Albany Capitol, the most important architectural undertaking of our time and country. It is the greatest monumental work of our age, and any design that is to be adopted for it ought therefore to be subjected to close criticism. While we would give Mr. Story credit for the boldness of his venture, and the great superiority of his scheme over the old one, we would urge that since the question has been opened to the consideration of a new project it ought not to be closed without carefully studying whether a design may not be secured which is much better than Mr. Story's.

The condition of the flats of the Potomac at Washington has been growing offensive for a good while, and lately has been so bad that it has become evident that something decisive must be done, or the city will become intolerably unwholesome. Since the death of four representatives and the illness of others have forced the danger upon the attention of Congress, it may be expected that some effort will be made to improve matters, but the case is a difficult one. The channel of the Potomac, which formerly ran near the southerly ends of the city streets, so that vessels could come to wharf on the Washington side, has for some years been shifting over toward the Virginia side, and flats have been forming and silting up in front of the city. The drainage of the town had never been good; but when, six or seven years ago, the Board of Public Works was put in charge, it was expected that the difficulty would be finally done away with. The Board collected the sewage into two or three great sewers, utilizing a sluggish brook that found its way into the river at the lower part of the city, and carrying the whole discharge from the dense central part into a sewer at the foot of Seventeenth Street, behind the White House and the Department buildings, where the low bank recedes most from the channel, and the flats are broadest. The system was ill considered, the pitch of the sewer small, and the main outfall discharged in the upper part of the city, where the flats are actually gaining on the river, and where sewage therefore lies upon them, and accumulates into a most noxious deposit. How the difficulty is to be remedied it is not easy to say. The drainage of a large city into a tidal river, a long way from its mouth, has never been satisfactorily managed, and the trouble is aggravated when the city is at the head of tide water, and bordered by flats. The natural suggestion is to build new sewers which shall deliver into deep water below the city, but this will be a costly work, and it may be difficult on so flat a surface to get a sufficient flow in the sewers. The plan of disinfecting and utilizing the sewage seems still less promising, for it has never been accomplished on the scale necessary for a large city.

The Governor of Ohio has called the attention of the State legislature, none too soon, it would seem, to the great injury that the State is suffering in the loss of her forests. According to his message, there were in 1870 nine and three quarters millions of acres of timber lands in Ohio, and in 1877 but five millions,—in other words, almost half the timber land that remained to the State seven years ago has been cleared, and that in a thickly populated inland State, where only one fifth of the area is now wood land. A like impolicy prevails in other timber-growing States, especially in the Northwest and in Maine. The danger of it is becoming known not only as an inconsiderate destruction of valuable property, but in its larger aspect as an injury to climate and soil, as is shown by the experience of countries which have been denuded of their woods. The probable diminution of rainfall, the certain injury to water-courses by the loss of the means of regulating the natural drainage, the increased suddenness and violence of freshets, the dwindling of streams, the aggravation of droughts,—all these things, tending to sterility and impoverishment, are known where lands have been stripped of their growth, and poverty and depopulation have followed. But while some of the far western States, where timber is scarce, are trying to redeem their scarcity by planting, the destruction of timber goes on wherever it exists as recklessly as ever. Already a good deal of land in the middle section of Maine is on the way to barrenness. Her unused water-power is still a reserved source of wealth for her when she finds a way to utilize it; but when her forests are gone there is no knowing how much of her water-power will be gone with it. As for interior States, when they have worn out their soil, and ruined its irrigation by the sacrifice of their woods, it is difficult to see what they will have left. The Secretary of the Interior might succeed, in spite of the clamor of politicians, in checking the depredations which destroy the value of our public lands; but it is hard to prevent private owners from cutting their own timber, no matter how recklessly. Yet it is hard, too, to have to permit in one man that use or abuse of his property which permanently impoverishes his neighbor and injures his country.

The annual season of conflagrations which comes every year, like the lyceum lectures, with cold weather and the lighting of hot fires, has set in within a week or two. The burning of the Honoré building at Chicago has been followed by two large fires in the business centre of New York, which together are said to have destroyed five million dollars worth of property, besides killing a fireman, and injuring two others. The lessons of them all are the same,—the risk and the extraordinary costliness of our inflammable ways of building, and the impossibility of securing any fire department that can save us from great loss of property and even of life. In the light of these fires we can see a glimmer of consolation for the probable loss of our forests which we have been lamenting in our last paragraph,—in the hope that at least the diminishing supply of lumber may at the end force us to build with more massive and less combustible material. The inadequacy of unprotected iron, our favorite substitute, to bear the fire, was freshly illustrated in the Chicago building, where the wooden floors of the store were carried on iron columns and girders. These, we are told, giving way under the heat, brought down the floors of the store which first burned and, pulling out the party-wall, let the fire through into the next. The Chicago papers have been discussing the inability of the fire engines to throw water to the top of the highest buildings. Where the tendency is to build as high as in New York, this inability is the more serious. By the present system the head of the water in the mains, often amounting to many feet, is of no use except to feed the

engines. It might be possible to invent a way of utilizing this by contriving engines which could be used at a higher level, at least where there are elevated roads; but it would be very difficult and costly, as well as probably of limited application, and the more economical and more satisfactory way is already approved by experience, — to build structures that will not burn. To this, however, the people of Chicago do not seem disposed to turn their minds.

It is said that the Congressional Committee on Coinage, Weights, and Measures will report — may have reported before this paper is printed — in favor of the metric system. What their recommendations will be, or what will come of them, remains to be seen; but there is no doubt that the metric system will in due time come into current use, and it is likely that when it comes it will come, like specie payments, with very much less disturbance and difficulty than is prophesied. In the mean time Great Britain is throwing away a golden opportunity and confirming herself in ways which she will probably find it desirable by and by to abandon. She is making a thorough overhauling and unification of her own weights and measures, which differ endlessly in various parts of the kingdom, but rejects the new system, adhering persistently to her old and laborious one.

A RETROSPECTIVE GLANCE AT SOME OF THE ARCHITECTURE OF THE FRENCH EXPOSITION.

IV.

THINGS which are needed are perforce interesting, though they may not be agreeable. But most architectural needs are capable of being made agreeable, as well as interesting. It is the fault of the projections last spoken of that, though conspicuous, they have been made, by the architect, to look neither interesting nor agreeable. Neither very interesting nor at all agreeable to look at are some vast arches between them. They are so treated as to be leading but most unfortunate features of the whole exterior. They are so big that you can see them from the other side of Paris. Yet they are not at all grand. Of course they cannot have the grandeur of voids, as they are necessarily filled with glass. And the glass is held not in what would just serve, which would at least be unobtrusive or scarce visible; and again, it is held — not in what though it would far more than serve its purpose, yet would possess a beauty in itself and so add to the beauty of the building as a whole, and not only excuse its presence but make it a delight — it is held in the most weakly designed of frames, — frames which, beside their great size and the fact that they are made of white stone, are conspicuous because their design feebly attempts to be ornamental. The whole has a poor and cheap look; and rightly, for the whole is poor in thought. It may have looked well enough on the drawing; but to take it for granted that what looks well on a drawing will look well in execution is a cheap way of designing. To make no account of the fact that until more delicate instruments, and more delicate hands to use them, than any we now have are created, the relations of parts to a whole will be entirely different in a building from what they are in a drawing, — to make no account of this fact is a cheap way of designing. To forget, as perhaps architects as eminent as he who designed this building often do, that the line we use to indicate the side of a house is no bigger than that we must use if we add a view of a spider's web on one of its window panes, and that therefore that will look rich and full and interesting on a drawing board which will look poor and thin and stupid on a building, — to forget this, I say, is a cheap way of designing. It is convenient, but the advantage is rather to the architect than to his building. It saves his time, and we all know that time is money. And it certainly is much better for his reputation to design a great many buildings well enough to pass than to design a few as well as he can do them. Only, when as spectators we look at the buildings so designed, while we congratulate the architect, we cannot help rather pitying ourselves. But further, a detail which may look well enough on the drawing board, or even when executed on a small scale on a small building, may be wholly unfit for a different usage, and can be used in such a way and on such a large scale in execution as to butter with poverty, as it were, a whole building. These window frames are executed on a vast scale, but as the design is poor in itself, and not only commonplace but one that we are accustomed to see executed on a small scale, the familiar and commonplace object, seen at a great distance without the uncertainty of outline and the air of mystery which distance lends to smaller familiar objects, does not seem large or any way uncommon. It loses all the advantage of its size. It thus belittles and makes poor the whole building, and the whole composition of which it forms a part. Everything is scaled down from these commonplace window frames, which you can see half or quite across Paris; and as, though big and holding the eye as soon as seen, they yet look poor and not big, so everything else connected with them, after seeing them, then looks poorer and more little. The narrow limits of the time allowed for the construction of this building may excuse hasty designing. The narrow limits of the pay of architects generally may excuse hasty designing in other cases. But not the less the spectator suffers a loss. Not the less is the building a sufferer, and a sufferer in proportion to the importance of the building.

When the outline of a building is just graspable in the distance, we scarcely expect to attain to a complete comprehension of the forms of its window frames or tracery. If we do, we doubt the building's being so far off or very large. We doubt it, in spite of the scales which other buildings about it or nearer us give. Of course we know it is big; but it is not what we know, but what we feel, when we are in the presence of an object that determines its value as a product of the fine arts. As long as I only know things about an object, it remains a prosaic object for me; I may know all about it and the way it is made; but the moment the way it is made gives me, apart from its direct use and incidentally, a feeling of pleasure, say, or pain, or awe, and so on, and does so intentionally, that moment it enters the dominion of the fine arts. If we know that an object, a building, is big, but none of us feel that it is grand, it is an inartistic object for us as far as its size is concerned. The truth of this appears in the subtle converse of this: as when I *feel* St. Peter's at Rome to be *grand*, and so an artistic object as far as its size is concerned, though I can scarcely believe it to be so *big* as I later, by walking around it, come to know it to be.

Now, not feeling this new Paris building to be grand, though judging by the scale of the other buildings about I come to know that it is big, naturally, if at all inclined to the study of the fine arts, I seek for a reason of this failure of the building to affect me as a fine-art object as far as its size is concerned. So reflecting, I recall that whenever, at the remotest point visible in that on which my attention is fixed, I find what I cannot clearly distinguish, my curiosity is stimulated, my interest is increased. If the object is one which, like a piece of architecture, seems to promise that a nearer view of its remotest point will reveal some beauty which distance conceals from me, a vague expectation of pleasure arises. The interest becomes a wish, a longing. But if, on the contrary, I find, at the remotest point visible in that on which my attention is fixed, nothing which I cannot clearly distinguish, — if I find nothing but some prosaic and uninteresting object with which I am perfectly familiar, my curiosity is not stimulated. I look forward to no pleasure in that direction, and in proportion as I think or fancy I had a right to expect it am I disappointed. We may again see the truth of this when we recall that to encounter the commonplace where we expect, as in distance, the ungraspable gives disappointment in other things than architecture. I look from a window at a fine prospect in a mountainous country. I look across the dusty road to that old wall, and over it to that meadow, and on to those oaks, and beyond to that wide-rolling country, and up the mountain-side, and to those peaks and the clouds, with ever-expanding and more and more ennobling emotions. Now, suppose I could place on that mountain-top some large, commonplace, plainly seen, and easily read object, like a vast patent-medicine sign, — or a big, square, white wooden hotel: would not that belittle and vulgarize the whole landscape? Would it not require an effort to resist its influence on our minds? Would it not be spoken of as "spoiling" the whole landscape? If then a big, commonplace object at its remotest point can be said to spoil so vast a thing as a landscape, what will it not do to a building? The mediæval architects never made this blunder. Their details are like crockets on a spire. They do not decrease in elaboration or apparent interest, though they often do decrease in size, as they retreat from the eye. And where, as in this Paris case, they wished to employ large archways for the admission of light at lofty and conspicuous points in their buildings, and to use glass in them also, we know how they not only made them amongst the most beautiful of the individual features of their buildings, but, by the multiplicity, fineness, and elaboration of their details, made them add, almost more than any other part of their buildings, to the effect of grandeur and beauty and wealth of thought of the whole.

Wealth of thought is just what the Paris building has to me the look of lacking. A wealth of thought, and thought to good purpose, has been expended on the plan. The whole plan seems to have been well thought out before committing it to paper. But the elevations, the building as it now stands, I could not help thinking far from a success. Those whom I heard speak of the building, whether Frenchmen or strangers, called it ugly. It is true that a thing may be ugly and yet interesting; but this is ugly and uninteresting. Its material, color, outlines, and relation of parts or proportions, all combine to make it rather ordinary-looking. A monumental building of brick, with stone finish, the brick of a faded pink color, with a clumsy outline like a big belly swelling out between two crab-like arms, with colonnades of small scale to be used on so large a plan, and with big bald windows and a tortoise-back shaped roof; such seems to me a not attractive, but also a not unfair description of this building. It does not seem to add to its interest that it is further adorned with two chimney-like and useless-looking campaniles, which are never to be lost sight of, though not in themselves especially happy as designs. There is about the whole exterior a kind of flavor, of which the views of it published give no idea, a flavor of being what some people call "Carpenters' Gothic;" a meaningful phrase, because it shrewdly grasps and roughly expresses the subtle idea that forms have been copied without the needs or the materials which called them forth being present.

But of course in the future the importance of the event which is

the occasion of this building will be relatively changed. The Exposition, though now playing or having played a certain and a more or less influential part in French history, will gradually be forgotten, or only be recalled to the minds of people by the building now erected to record it. A building as grandiose as would when the Exposition first opened, or as would even now seem fitting, will then seem out of place. Brick will then seem a material quite monumental enough for its object, pink a very cheerful and pretty color; the Parisians will go on adding statuary and ornaments, as their habit is, until the clumsy outline is quite lost; the colonnades that now look too little will then look dainty; the bald big windows will get filled up with tracery — not Gothic, but in the untrammelled style of the rest of the building; what is then seen of the roof over some perhaps added parapet will, with thoughtful treatment or adornment, come to show itself like some tortoises' backs — beautiful. A use will be found for the campaniles, and, in fitting them to that use, they will get very likely an added vigor not only of purpose but of outline. Meantime the flowers, the shrubs, the trees now planted will grow; storms will beat, and the flow of the fountains and cascades, which some added serrations in their lips will have made more sparkling, will leave a kindly stain. It is true that we cannot credit art or architects with the effects of time, for from their uncertainty they cannot be so foreseen as to enter much into artistic calculations. But this is not only true of this building but of all buildings. We often forget this, and credit the architects of the admired monuments of the past with a charm due to accidental effects of time and forces wholly absent from their calculations. It is just because of this habit of ours that it is proper to think of what time will do for this building, when judging of its success as compared with other buildings.

The site, the occasion, and the money spent have given an opportunity to add another to the architectural pleasures of the world. If that has been done, if a beautiful building has been made, we may profit by the study of it. If that has not been done, if a complete success has not been achieved, if the sight of the building fails to give us pleasure, we may still profit by the study of the causes of defeat. We may learn what to avoid. The chances are that such study will especially reward us; for that which produces a disagreeable effect on the spectator we know is often detected by ordinary minds: whereas that which gives pleasure may be the product of genius, and so the secret of its pleasure-giving power be often, perhaps always, beyond the grasp of even extraordinary minds.

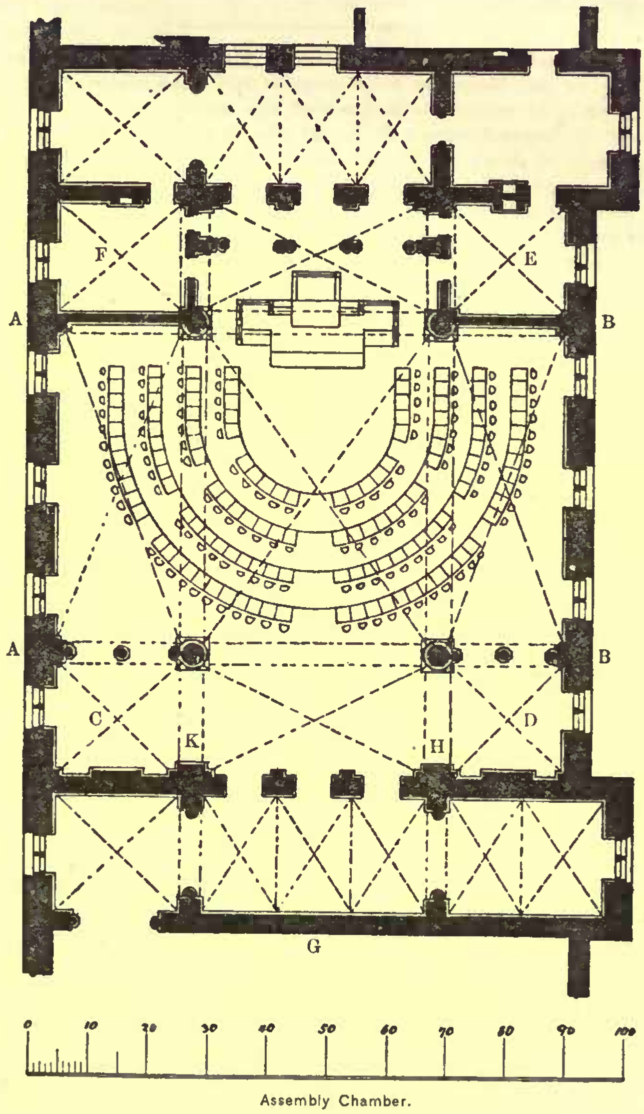
THE NEW ARCHITECTURE AT ALBANY.

II.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

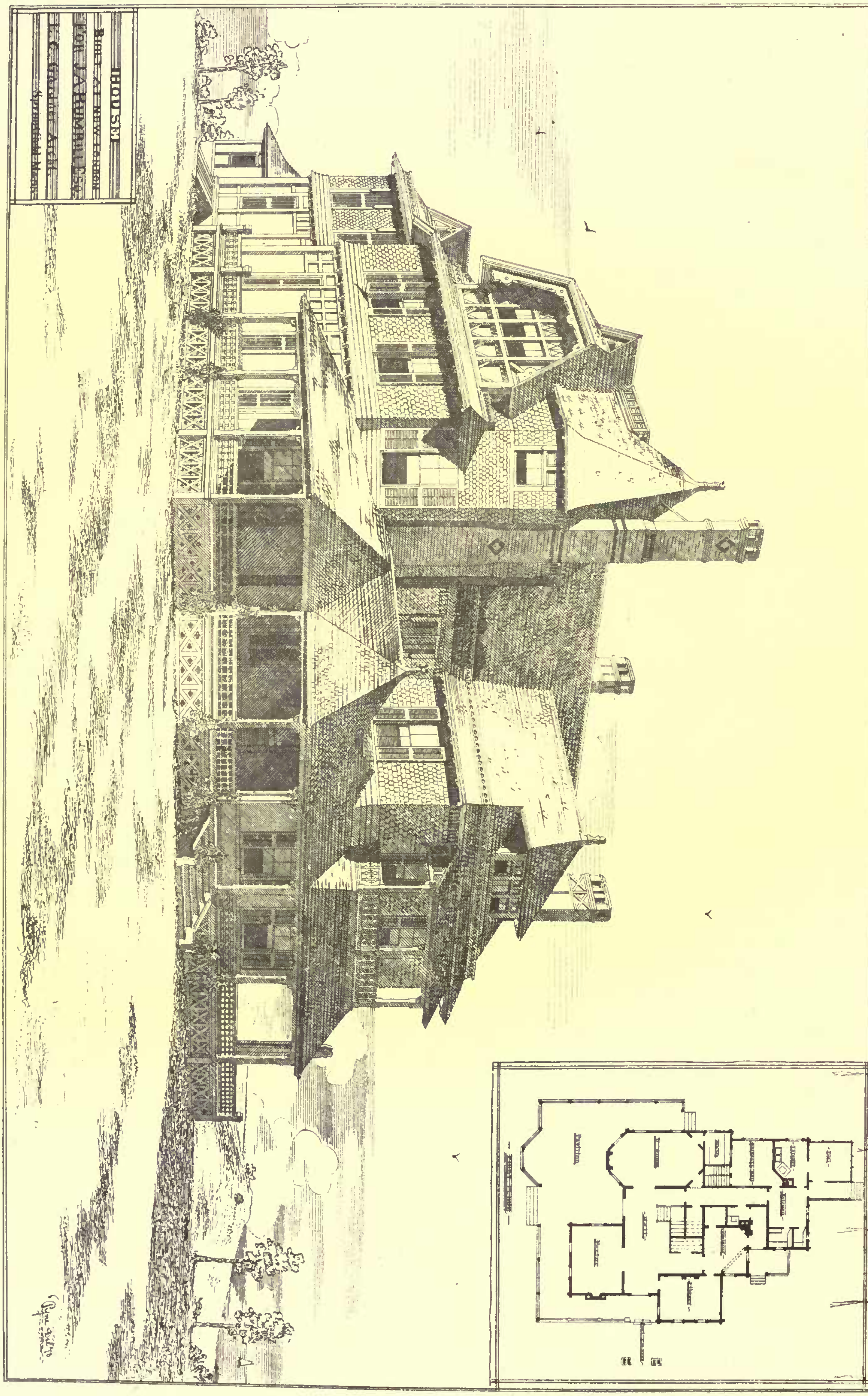
Sir, — In the letter which you printed last week I ventured to give my impressions of the exterior architecture, and the interior decorations and constructions, of the new capitol at Albany. In this letter I propose to devote myself to a description and study of the essential points of the Assembly Chamber.

This room has already achieved a reputation as presenting the most monumental interior in the country; it certainly has the primary advantage of size, without which element no contrivance or skill of the architect can avail to produce an effect of grandeur, although of course it is a very common thing for architectural effort to be so ill bestowed as to diminish the apparent area. In this case the full value of the available space as an element of effect has been retained by the judicious simplicity of the leading features as contrasted with the complication and delicacy of the subordinate parts. Four great polished red granite columns with marble capitals sustain a vast quadripartite vault of stone over the central space; this vault is surrounded by four narrow lateral vaults with four square vaults in the corners, all having their outer bearings upon wall piers, as shown upon the accompanying plan. This simple disposition at once fills and satisfies the mind and leaves no essential point to be explained. The square compartments C and D are enclosed upon the floor with open stone screens supporting galleries about two thirds of the way up the height of the shaft; on a level with the capitals of the shafts is a higher gallery, extending across the end of the hall over the lobby G; a disposition of features nearly similar occurs at the other end of the hall, back of the Speaker's desk, so that the longitudinal dimensions of the upper regions are extended to the outer limits of this plan. This arrangement of galleries is very noble and impressive. The screen surfaces beneath them are highly enriched in the spandrels and over the arches with incised diapers, giving to them, with their filling of positive color distributed in small quantities, an effect almost Saracenic in profusion of surface enrichment. The lower galleries are furnished with stone railings pierced with patterns in geometrical Gothic; those of the upper galleries are flamboyant in character and broken around the piers at H and K, thus forming great corbelled capitals. The wall-surface B B is in the centre of the north front, while A A opens on the central court. These two wall-surfaces include the two upper orders of the central division of the façades, which I have already described. On each side we have thus two stages of windows, the lower stage showing three great round-arched windows on the main floor level, the upper showing six small divisions of the famous so-called Romanesque arcade, all glazed; two other continuous divisions of the arcade flank this range over the square compartments on either side. Between these two stages is a frieze or belt of panels to be occupied by Mr. Ward's bas-reliefs, and in the tympanum, formed on each side of the hall by the pointed lateral vault impinging against the wall-surface over the archivolts of the arcade, appears Mr. Hunt's decorative painting, too high to be easily seen from the floor, occupying a space too small by comparison to be conspicuous, and too much bedazzled by the windows beneath to assert itself as an indispensable element of the decorative scheme. The conditions of Mr. Hunt's work are seriously complicated also, first, by the large, positive, incised decoration, enforced with black

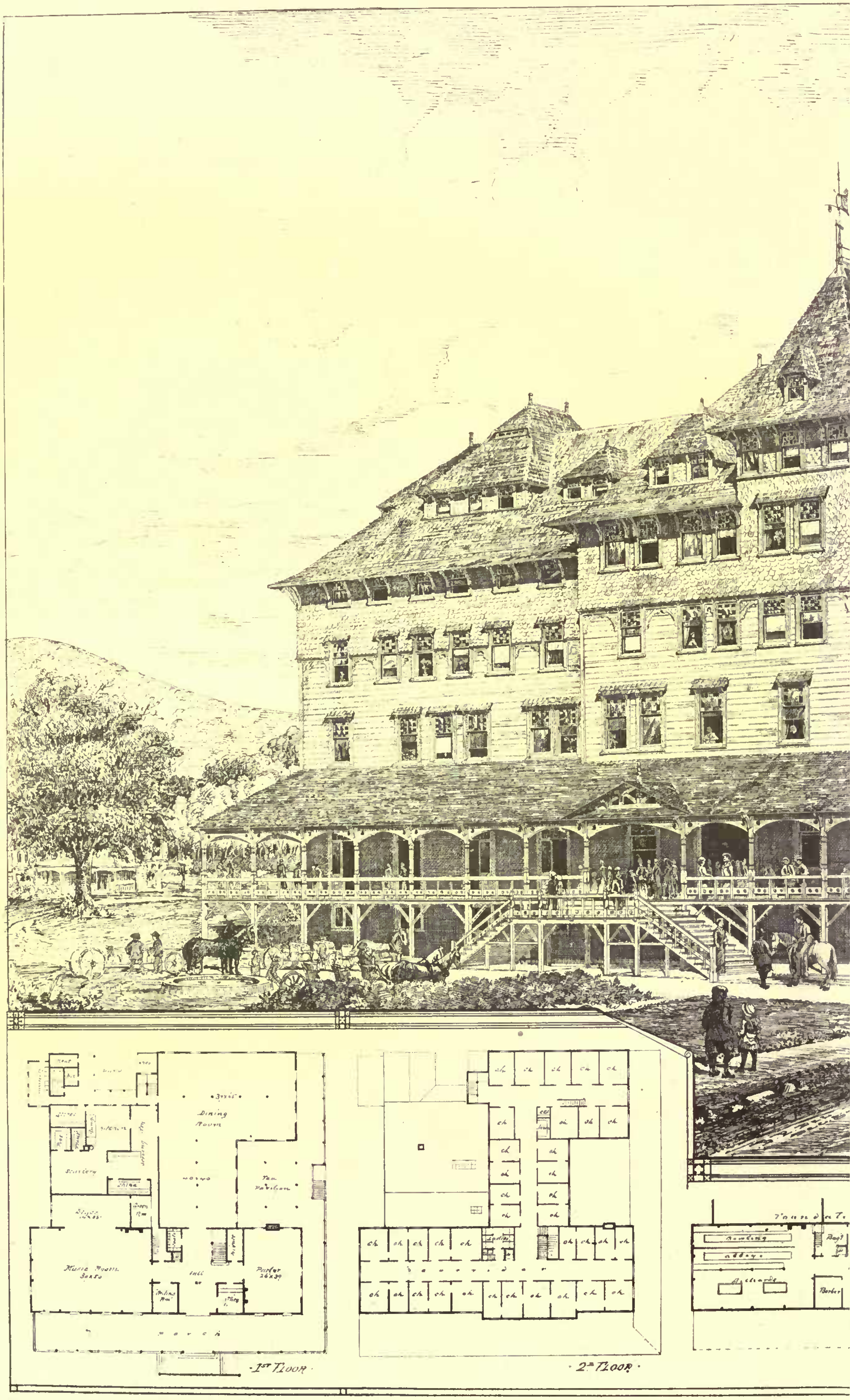


Assembly Chamber.

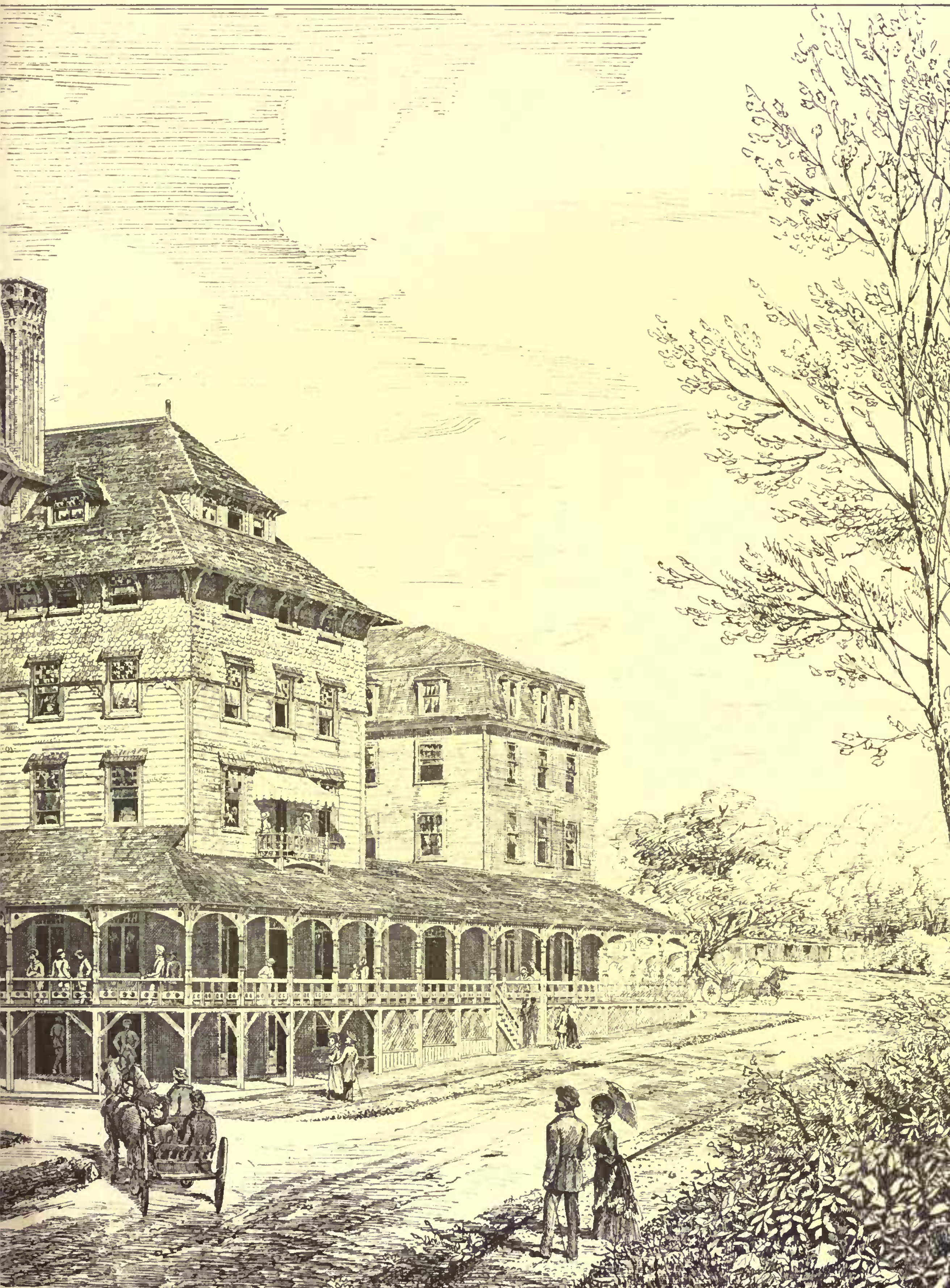
and primary colors, with which many courses of the stone *remplissage* of the vault are embellished, and, second, by the absence of a wall-rib which should prevent these decorative ranges from coming into absolute contact with the edges of the painting. With such unsympathetic surroundings it would seem that the only way by which Mr. Hunt could secure to himself the necessary freedom in his composition, both as regards form and color, was to isolate his pictures, after the fashion of the Venetian and Roman masters of fresco, by a surrounding frame, or to make a conventional background of black or gold against which his subject should be projected. I cannot but think that the manner in which he has carried his picture out to the perilous edges of the spaces at his disposal, and his preference for the natural rather than for the conventional treatment of his subjects, are, under the circumstances, not justified by the results. No artist, however subtle, could secure in such a place the preëminence which is due to a work of higher art unless he frankly started with the determination to vanquish these surroundings by a *tour de force*, and create rather a pictorial decoration than a decorative picture. The decision and firmness of the conventional forms by which the neighboring vaulting surfaces are enriched, the general character of the architectural features by which these tympana are beset, and the blaze of light which penetrates the arcade beneath them, all these appear to demand of the artist not so much measures of compromise, as measures of absolute conquest. Mr. Hunt's vigor of drawing and boldness of color have hardly proved sufficient to this task. There are, however, vacant wall-surfaces under the vaults at the ends of the hall, far better lighted, which offer a much better field for such work as Mr. Hunt has given, and which we understand he will be invited to occupy. But the immediate results are unimportant as compared with the fact that an attempt is here made on a great scale to give to Architecture and to Painting their proper relations in respect to each other. No one interested in the progress of better art can be

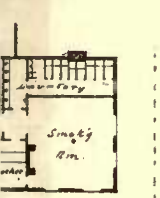


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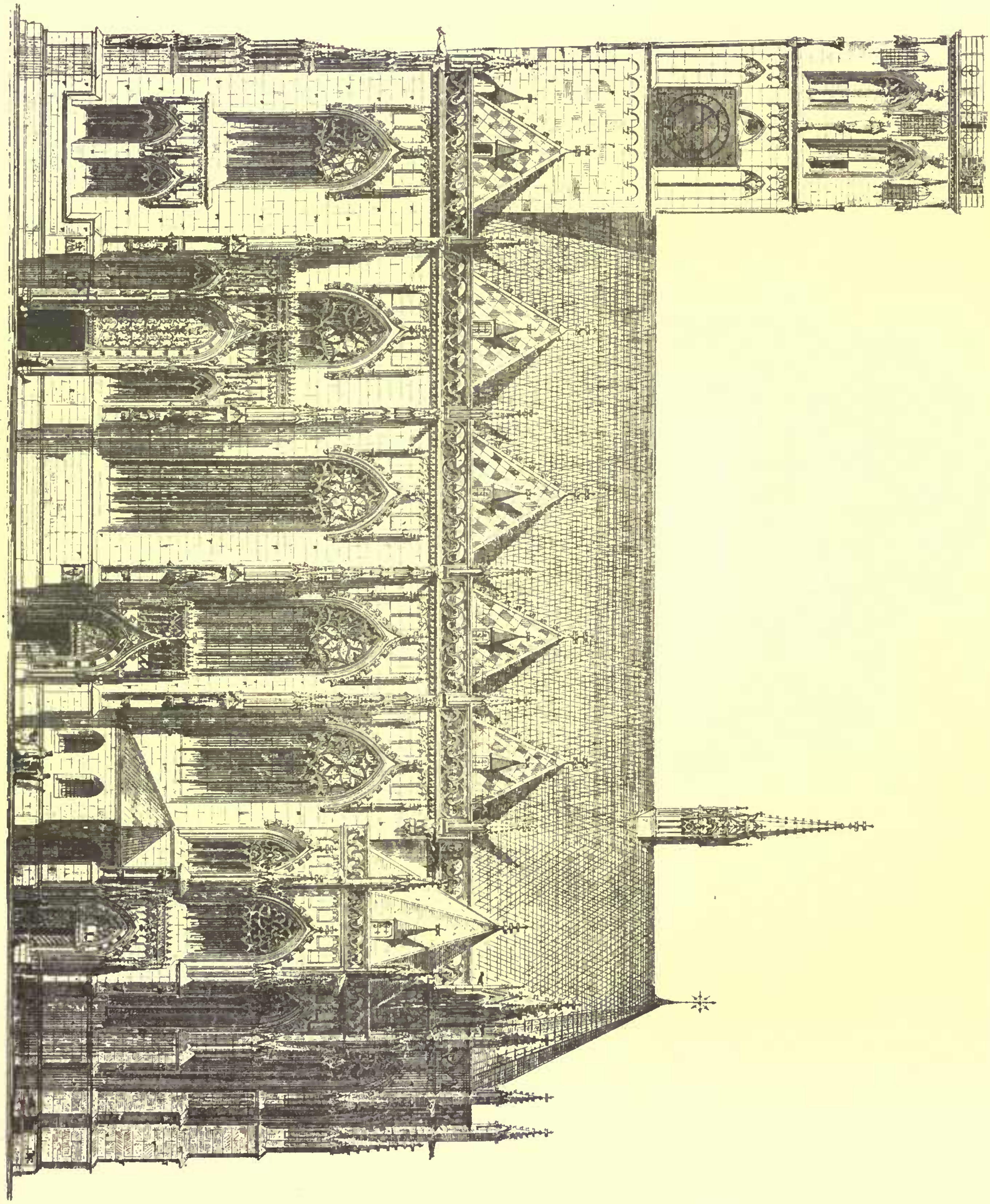
BASEMENT,

WEST · END · HOTEL

BAR · HARBOR · MT. DESERT · ME.

BRUCE · PRICE · ARCHT. · N·Y·

·DEC. · 78·



St. Lambert's Church, Münster, Westphalia.

The Heliotype Printing Co. 220 Devonshire St. Boston

indifferent to a beginning so noble in its intentions and so fruitful in its promise.

There are several vital points of design with respect to this magnificent ceiling which the careful critic cannot fail to notice. Mr. Eidlitz, true to his *parti pris*, exhibits in this part of the work his characteristic indifference, even to those external conditions of the façade which he might himself have controlled and adapted to his interior if he had so chosen. His vaulting at the wall-piers A A and B B starts below the level of the upper arcade of windows, which was designed and executed under the present administration of the work, and *cuts across* those openings of the arcade which adjoin the piers in a manner which in France would be called brutal, but which we should prefer to characterize as audacious and defiant. Moreover, one looks in vain for an abutment to the thrusts of these vaults at the points named; there is no such appliance to be seen within or without, nor is the honesty of the Italian builders imitated by any visible tie at the springing line. But even this magician cannot conjure up a vault which will hold itself, and we must seek in the dark recesses above the vaulting for the hidden contrivances of iron which must bind the construction together.

All this work is Gothic, and Gothic which is at the same time vigorous and delicate. The lower parts of the wall-surfaces are profusely decorated with countersunk arabesque, defining the masonry of the wall, and filled in with strong color, well contrived to unite with the stone and relieve it from coldness and monotony. The scale of the corresponding decorations in the filling-in of the vaulting surfaces is so much larger than that of the diapers below, and occupies so much more of the space, that the effect of masonry, at the point where it is most desirable to show the solidity and reality of the work, is in part lost. The vaulting is so noble that to treat it thus seems almost like a painful excess, and it has certainly, as I have intimated, increased the difficulty of an artistic treatment of the wall-surfaces. The furniture is in all cases carefully designed and of course very richly decorated, and the drapery of the lower windows is sumptuous in fabric and large and noble in detail. The chimney-pieces under the square galleries and in the neighboring offices are of sculptured stone, and in some cases very elegant; but they seem in scale somewhat too domestic and hardly adequate in size of opening. The obvious difficulty of arranging the screen-work under the square galleries, so that it may adjust itself against the four great, round shafts, is frankly acknowledged, but the solution here attempted is not in all respects satisfactory. In short, in the innumerable details of an architecture so vast and complicated as this, a critic might find a boundless field for objections more or less petty if he chose to hunt for them. Yet, setting aside, for the moment, my objections to Mr. Eidlitz's contemptuous indifference for the casket in which his jewel is enshrined, I am prepared to believe that there is no modern work recalling the mediæval spirit of design, conceived with greater intelligence and learning or executed in a manner more thorough and, on the whole, sincere.

Mr. Richardson will, it is to be hoped, remember his academic training in the schools of Paris, and respect the exterior enough to continue at least the sentiment of it into the portion of the interior assigned to him. But as to the qualities of design and workmanship, he will find in the parts already done within the north wing a competition of the most stimulating kind. H. V. B.

THE ILLUSTRATIONS.

WEST END HOTEL, BAR HARBOR, ME. MR. BRUCE PRICE, ARCHITECT, NEW YORK.

THIS design represents an addition now making to the Heywood House, the part of the building here shown with a "French roof." The *motif* of the exterior is an umbrella, the intention being that where there is a roof or porch it shall shield to the utmost the building, and the guests, from sun, wind, rain, and storm. On plan, the main feature of the principal floor is the music-room, a large room for music, dancing, theatricals, and the other in-door recreations of a seaside resort. The basement is essentially the men's quarters, and gives them, quite removed from all danger of offence to Dame Propriety, all that can be desired for making it their especial domain. The building will be painted in Indian red, brown, and olive green. It will be ready for guests early in July.

RESIDENCE FOR COL. J. A. RUMRILL, NEW LONDON, CONN. MR. E. C. GARDNER, ARCHITECT, SPRINGFIELD, MASS.

ST. LAMBERT'S CHURCH, MÜNSTER, WESTPHALIA.

We here reproduce the south side of the Church of St. Lambert, which, like the other views of it which we have published, is copied from the *Allgemeine Bauzeitung*.

THE CONSUMPTION OF WOOD. The Detroit *Free Press* says that the annual demand for the ties and sleepers of our 90,000 miles of railway is estimated to be in round numbers about 40,000,000 square feet. We have about 75,000 miles of telegraph wire to put up, for which 800,000 trees are needed, while repairs possibly call for 300,000 more trees a year. The common lucifer match uses up 300,000 cubic feet of the finest pine annually. The bricks baked every year require 3,000,000 cords of wood, which would be all that 50,000 acres of average timber-land would contain. Shoe-pegs exhaust annually 100,000 cords of wood; lasts and boot-trees some 500,000 cords of beech, birch, and maple, and about as much more is required for the stock of planes and other tools.

CORRESPONDENCE.

THE DEATH OF MR. GRIFFITH THOMAS.

NEW YORK.

MR. GRIFFITH THOMAS, the architect, died at his residence in this city, 92 Fifth Avenue, on Saturday, January 11. As an architectural designer and in the active pursuit of his profession he has done more to build up this city during the past forty years than any two men in the same line of effort. In one sense his success was up to the full measure of the most sanguine expectation, in another sense he was not a desirable member of the profession. Much may be said in his favor, very much indeed, but on the other hand it is not to be denied that much of his work was commonplace. He seemed to have opportunity for the carrying out of magnificent architectural ideas, for making the metropolis of the New World a city of beautiful structures, but the kindest criticism which can be passed upon the hundreds upon hundreds of costly buildings over which he stood as creator is that they were not shams. Taught under good professional guidance in the office of his father, he so perfectly caught the spirit which animated all the designs of the senior Mr. Thomas, that to-day the line can with difficulty be drawn between the buildings erected fifty years ago by Thomas Thomas, and the erections of the past decade by the gentleman who has just died.

The name of Thomas became known in this city, in circles of architecture, on the arrival of Thomas Thomas, a native of the Isle of Wight, who had studied in England under the tuition of Nicholson. The older architect had three sons, two of whom became architects, and the third went into carpentry and became a master-builder; Griffith remained with the father, while his brother in the profession opened an independent office. It was in 1838 that Griffith came to this country. He was then a stripling of eighteen years, but a good draughtsman, and on the wall of his private office hangs an excellent copy of a perspective view of the interior of the Pantheon at Rome, done as a piece of practice, but done *con amore* as well, for the young Thomas imbibed from his father the tradition of the office in regarding the classic and Italian modifications as the style suited for city buildings. Thomas Thomas built up a good professional practice, and many important commissions were given him. Griffith was an ardent student, and his shrewdness as a business man soon enabled him to take entire control of the business, though as long as the senior lived his name remained at the head of the firm. The Barnums, Ciscoes, Johnsons, Bishops, and Wolfs were among the patrons of the firm of Thomas & Son, and for years past the Astors, father and son, have availed themselves of their aid. Griffith Thomas had two sons, who entered the office of their father, but died after attaining their majority, and shortly after the head of the family in America followed them, leaving Griffith as the only architect of the name.

Personally Mr. Griffith Thomas was a man of fine presence and engaging manners, and one of tireless energy. From eight to one o'clock each day he was to be found at his office, and his capacity for dispatching work was very great. His working drawings were models of thoroughness and accuracy, and it was a boast of his that he had never overrun the estimates he had laid down for any particular building, where his plan was adhered to. Outside of his business he was a man of most expensive personal habits, and, with a princely income, he lived in a very quiet though almost royal way. On this account it is doubtful whether he leaves a sum bearing any proportion to the amount of his professional fees during his forty years of practice in New York. To recite a list of the works carried out by the architects Thomas would be to give a series of the most expensive and important buildings in the city. He built in a princely way and with a liberal margin financially. The client of Mr. Thomas could rely upon getting a substantial structure; that the buildings were satisfactory in other respects is evidenced by Mr. Thomas's popularity as a designer. Work fairly poured in upon him, and striking upon a period of such great financial freedom, and even prodigality, he profited personally in an exceptional degree. Many millions of dollars were spent in permanent building improvements under his direction, and it is said that by actual count each block on the length of Fifth Avenue to the Park has an average of three of his buildings. Brown-stone was his favorite material, though in building a magnificent residence for himself on Fifth Avenue near 42d Street, now a part of the Bristol Apartment House, he chose a lighter sandstone. For business structures, he soon recognized the value of iron, and set to work duplicating forms of stone in that metal, until Broadway and the dry-goods districts of the city are crowded with these metallic-stone constructions. When the old New York Hospital was removed from the lower part of the city, the closed space was in a large measure covered by these great warehouses under the supervision of Mr. Thomas; one was a duplicate of another, and the actual effort of designing was the merest trifle. One of the first of his iron structures was the Lord & Taylor store at the northwest corner of Broadway and Grand Street. The idea took, and when many of the great business houses of New York were seeking new houses Mr. Thomas aided in supplying the want. The United States Mortgage Company's building on Wall Street is a Thomas building, and among the other banks are the Chemical Bank building, the Park Bank, the Greenwich Savings' Bank on Sixth Avenue, and the New York Life Insurance Co.'s building, in which Mr. Thomas for eight years carried on his business. Taylor's Hotel, the Brandreth House, Fifth Avenue Hotel, St. Nicholas Hotel, and the St. James are examples of his work in that line. The Grand Opera House at

Eighth Avenue and 23d Street was constructed by him for Mr. Pike, the Cincinnati millionnaire. Mount Sinai Hospital and the Women's Hospital are his, as are the Stock Exchange, Astor Library, and the Society Library, the Kemp Building at William and Cedar Streets, and the structures at William and Pine Streets, the Domestic Sewing Machine building, the Singer Machine Co.'s building, and the Duncan Building on Union Square, the Potter Building at Lafayette and Astor Places, stores of Arnold, Constable & Co. at 19th Street and Broadway. In church architecture, as might have been expected, the Thomases were no willing competitors. Dr. Spring's Brick Church on Fifth Avenue, the Madison Avenue Baptist Church, and the 23d Street Baptist Church, with the Chapel of the First Baptist Church on Park Avenue, are about all, with one or two country churches, they ever built, but it was in private residences and in large buildings for business uses that the bulk of their practice lay. Out of town little business was sought, since the character of the city buildings was not such as to create a fame in other places. The designs for the Kimball House in Atlanta, the first part of the Palmer House, Chicago, with banks in Pittsburgh, Pa., and Paterson, N. J., are from the Thomas atelier. In competitions Mr. Thomas was a ready entrant, and a very successful competitor, as a rule, the class of buildings which he designed creating a favorable opinion in the mind of the ordinary layman. In association with his fellow-architects Mr. Thomas was very distant. He joined no chapters and institutes, though he was not opposed to them, merely feeling self-confident enough to refuse to enter them. He was a most systematic worker, and by his death on Saturday from a rush of blood to the head New York loses a memorable citizen. A dozen essays might be written on the lessons of his life. His death, so soon after that of Mr. Upjohn, might suggest a parallel between these two men, of one profession, yet so diverse in mental and artistic feeling and sympathy. W.

PRIAM'S PALACE.

WHAT I have brought to light of the Trojan houses in general, and of the last Town-Chief's or King's mansion in particular, are merely the substructures, on an average five feet high, which in the absence of cellars served as store-rooms. A similar habit of using the ground-floor as store-rooms appears to have existed at the time of the poet, for we see in the Iliad (vi. 288, 289) that Hecuba descends to the store-room where the artfully embroidered garments were stored. Had the store-room been on the floor inhabited by the family, the poet would not have said that the Queen descended. The substructures of the royal house consist of uncut stones joined with clay; the inner side of the house-walls has a thick coating of clay which has been whitewashed with clay. If asked, "Is this Priam's palace, as described by Homer?" (Iliad, vi. 242–249) I would answer by the verse of Virgil: *Si parva licet componere magnis.* In fact, according to the poet, the palace contained fifty chambers for the King's sons and twelve for his daughters, and all were of polished stone. But Homer can never have seen the Troy whose tragic fate he describes, because at his time, and probably ages before his time, the city he glorifies was buried beneath mountains of *débris.* But at his time public edifices, and probably also royal mansions, were built of polished stones, and he therefore attributes the same architecture to Priam's mansion, magnifying it with poetic license. This building has towards the gate a corridor 40 feet 8 inches long by 6 feet broad, leading to a chamber only 7 feet 6 inches long by 4 feet 6 inches broad, in which the ingenious Dr. Moss discovered a gutter of hemispherical form; this room is nearly filled up by a huge jar 5 feet 6 inches high and 4 feet 7 inches broad. By a door only 1 foot 0 inches broad this chamber communicates with another large one, which is 12 feet 3½ inches long and 7 feet 4 inches broad, and contains three immense jars of precisely the same size as that just referred to, and a somewhat smaller one; the pottery of the jars is upward of 2 inches thick. From this room we enter, by a door 3 feet 2 inches broad, into a larger one, which runs parallel with the aforesaid corridor, and is 24 feet 4 inches long and 12 feet broad, and leads to another chamber 10 feet long and 8 feet broad. This is the best preserved part of the mansion, to which belong also the buildings which separate it from the northern part of the great wall. I therefore do not see any reason why the mansion, if, as is highly probable, it had five or six upper stories of sun-dried bricks or wood, may not have had even more than one hundred smaller or larger rooms. I secured one of the bricks, which is 2 feet long, 1 foot 3 inches broad, and 3½ inches thick, and which has in the conflagration been converted into burned brick.

In several directions beneath the royal mansion we see the walls of a still more ancient building, which we cannot but ascribe to the first city erected on these sacred premises, because all the fragments of pottery which we find in the very chambers of the ancient mansion, immediately below the Trojan stratum, have on both sides that beautiful lustrous red, black, or brown color which I never yet found elsewhere but in the strata of the first city. I now feel even bold enough to say that the great circuit wall was not built by the Trojans, but by their predecessors, because in carefully digging off the *débris* from that wall I find it covered by a layer of rubbish about one foot thick, which is not Trojan, because it does not contain any burned matter, and because it is full of pottery peculiar to the first city, which cannot possibly be there by mere accident. Above this layer the great wall is covered six and seven feet deep with brick-colored ashes of the tower-like buildings of sun-dried bricks and wood, which once served both as its ornament and as its works of defence, and Dr. Moss calls to my remembrance that in this respect Troy resembles several cities in Scripture; so, *e. g.*, Joshua (ii. 15) describes the house of Rahab, situated on the circuit-wall of Jericho. I have equally acquired the certainty that the gate, which has now turned out to be treble, was built by the inhabitants of the first city of large, rudely-cut white stones, which we see in all the lower layers of the gate-walls, and the passage was paved by them with white flags. The succeeding people, whom I identify with the Trojans, had merely repaired the gate, covering the white flags with others of a reddish color, and heightening the side-walls of large white slabs by a masonry of small stones. The reddish flags, having suffered too much by the white heat in the conflagration, have nearly all crumbled away since I brought them to light. Of the white flags I lifted one, and having dug beneath it a large square hole, three feet deep, I only found there potsherds belonging to the first city. The third gate is 17¼ feet broad, and beyond it the masonry continues still for ten feet on either side. Of course, the three gates, as we now see them, are merely the substructures of a tower-like building of sun-dried bricks and wood.

One of the most curious objects ever found here is undoubtedly a distaff 11 inches long, around which is lengthwise wound a large quantity of woolen thread, black like coal, probably from being charred; but I trust that, locked up in a glass vessel, it will keep very well. I discovered it in the royal mansion, at a depth of 28 feet below the surface. According to Dr. Moss, the wood of the distaff is the stem of a very young tree. — *Dr. Schliemann in The Athenæum.*

DESCRIPTION OF A PAPER DOME FOR AN ASTRONOMICAL OBSERVATORY.

AN astronomical observatory has recently been erected for the Rensselaer Polytechnic Institute, through the liberality of Mr. E. Proudfit, of this city. In maturing the plans and supervising the erection of the building, I have introduced an improved method of constructing revolving domes, a brief account of which may not be without interest.

While making the preliminary inquiries, I ascertained that a dome of the dimensions required, constructed in any of the methods in common use, would weigh from five to ten tons, and require the aid of cumbersome machinery to revolve it. It therefore occurred to me to obviate this objection by making the frame-work of wood, of the greatest lightness consistent with the requisite strength, and covering it with paper of a quality similar to that used in the manufacture of paper boats; the principal advantages in the use of these materials being that they admit of great perfection of form and finish, and give extreme lightness, strength, and stiffness in the structure, — prime qualities in a movable dome. A contract was accordingly made with Messrs. E. Waters & Sons, of this city, the well-known builders of paper boats, for the construction of the dome, and they have carried out the undertaking with great skill and success.

The dome is a hemisphere with an outside diameter of twenty-nine feet. The frame-work consists primarily of a circular sill which forms the base, and two semicircular-arch girders set parallel to each other, four feet apart in the clear, and spanning the entire dome. These are firmly attached to the sill and kept in a vertical position by means of knee-braces. The sill and girders are of seasoned pine, the former being 8¼ inches wide by 3½ thick, and the latter each 4½ by 3 inches.

The paper covering of the dome is made in sixteen equal sections, such that when set up side by side, their bases on the sill, and their extremities meeting at the top, they form a complete hemispherical surface. The frame-work of each section consists of three vertical ribs of pine each 3¾ inches in width and ⅝ of an inch thick, one at each side, and one midway between, and meeting at the apex. The paper was stretched over this frame-work as follows: —

A wooden model of full size being made of that portion of the dome included within one of the sections, with a surface truly spherical, the frame-work of a section was placed in its proper position on the model, so that its outer edges formed part of the same spherical surface, and covered with shellac where it was to be in contact with the paper. The sheet of paper cut in the proper form was then laid on the model while moist, the edges turned down over the side ribs, and the whole placed in a hot chamber and left until thoroughly dry. In this way the several sections were dried in succession over the same model. The paper used is of a very superior quality, manufactured expressly for the purpose by Messrs. Crane Brothers, of Westfield, Mass. Its thickness after drying is about one-sixth of an inch, and it has a structure as compact as that of the hardest wood, which it greatly excels in strength, toughness, and freedom from any liability to fracture.

After being thoroughly painted, the several sections were ready to be set up side by side on the sill, and connected together by bolting through the adjacent ribs. The space between the arch girders being left uncovered on one side from the sill to a distance of two feet beyond the zenith, the upper ends of the sections required to

be cut off and accurately fitted to the girders. The joints between sections were made weather-proof by inserting a double thickness of heavy cotton cloth saturated with white lead paint. The adjacent side ribs were then bolted firmly together through the paper and cloth, the lower ends attached to the sill by angle irons, the upper ends bolted to the girders, and the lower edge of the paper turned under the sill and securely nailed. The joints were afterwards painted over on the outside. As the entire surface exposed is free from nail-holes or other abrasions in the paper, the structure promises, with an occasional coat of paint, to last for many years, and to form an effective and serviceable roof.

The four-foot opening between the arch girders is covered by a shutter, which is also of paper stretched over a wooden frame. With the exception of about two feet at the lower extremity, this shutter is in a single piece. Attached to its sides are a series of iron rollers, which run on a railway track of band iron laid down on the girders, by which means the shutter can be moved over to the opposite side of the dome. The wooden sides of the shutter have iron flanges attached to their lower edges, which project under the railway tracks, making the whole weather-proof. The shutter is opened and closed by means of a windlass and wire rope.

The weight of the dome and its appurtenances is about 4,000 pounds. It is supported on six eight-inch balls which roll between grooved iron tracks, and can be easily revolved by a moderate pressure applied directly, without the aid of machinery. — *Professor Greene in the American Journal of Science and Arts.*

PLASTERERS' WAGES IN ST. PAUL.

ST. PAUL, MINN., January 11, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — The building trade of St. Paul from present prospects looks very good, I have a number of buildings on hand with a good prospect ahead.

Plasterers' wages, like all other wages, are low. Good work is being done at sixteen to eighteen cents per yard.

Yours very truly, LEROY S. BUFFINGTON.

A CORRECTION.

NEW YORK, January 14, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Your New York correspondent has given me credit in his last letter for a pretty bit of Queen Anne work which I did n't do — the front on Fifth Ave., near Thirtieth Street.

I believe it was done by my friend, Mr. Haight, and I beg you will do him justice in your next. Yours truly, G. E. HARNEY.

A PROPOSED ALTERATION IN THE LAW RELATING TO WOODEN BUILDINGS IN BOSTON.

BOSTON, January 21, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Some of the members of the Society of Architects in Boston will remember how much pains they took and how many hundreds of dollars they spent before the great fire in Boston, in framing a building law; and the whole society knows that the law as passed does not come up to the standard of the society. Such careful restrictions as an uneven intelligence has left, however, should not be given up without a struggle for common sense, even if we cannot have technical perfection in the law. It is well known that outside of what are called the "building limits" of Boston, wooden buildings are allowed of certain fixed heights, determined by the grade of the street. For instance, one part of the ordinance provides that "no wooden building, to be used for other purposes than a dwelling-house, shall exceed a height of fifty-two feet above the sills, and said sills shall not be laid below the grade of the street, and not more than three feet above the grade as established by the city." This is a rule made for safety. It may be the occasion of inconvenience, now and then, to individual owners or builders, but the property of the mass of owners and builders is the safer for it. The individuals also who are reluctantly compelled to comply with it gain by it in the long run.

Nevertheless, in the Boston Common Council a member proposed, the other day, to amend the law as above stated by adding to it the following words: "unless otherwise directed by the Inspector of Buildings." This is a new use for the inspector. Instead of notifying builders to obey the law, he is to make the law, when the builders notify him of what they want.

Whether the Society of Architects drew this particular rule or not, it is quite certain that they would prefer it to the discretion of any individual who may happen to be the Inspector of Buildings. The newspapers say that there is to be a hearing concerning this matter, before the Joint Committee on Ordinances, and if persons who are informed about the matter, and who have the safety of the city at heart, take pains to appear before that committee and show them what a disastrous effect such a lawless ordinance might have, they will do a public service. Perhaps it is necessary to allow wooden buildings in some places, but it is not necessary to allow them to be of a height unlimited except by the inspector's discretion. OBSERVER.

GAS BUOYS.

THAT the buoys which mark channels and wrecks are sometimes destroyed or displaced by vessels running along the coast on dark nights is well known. After two trials of lighted buoys, therefore, the Trinity Board have resolved upon sending a buoy, of which the lantern can be kept continuously burning, to a station off Dundee. The first of these trials took place in August last at the Trinity Wharf, when the light lasted uninterruptedly for twenty-eight days. Water was pumped upon it from a steam-engine, to see what would be the effect of the shock and drenching, and no harm was done. The buoy was then sent down to the Nore, and there burned steadily for twenty-four days. The same buoy has now left London for its appointed place near Dundee. Provision has been made for keeping it alight without any interference for thirty-four days. It is a buoy of most awkward construction; but this does not lessen its usefulness, and others are being more skilfully made to receive the same illuminating apparatus. This is a modification of what is known as Pintsch's compressed gas system. It was first brought out in Germany, and originated from the demand of some of the railway authorities for a better means of lighting their carriages than that afforded by common oil lamps. Attempts to light railway trains by ordinary gas were first made in England about fifteen years ago, and either the quantity wanted for the whole train has been carried in the break-van, or each carriage was provided with its special bag. The expense and trouble in all instances have been very great, and almost prohibitive. After several failures with coal gas, Mr. Pintsch at last adopted a rich, heavy gas, extracted from oil, which he employs in a compressed state; and he soon found that it was not only better, but easier, to make the lighting of each carriage independent of the rest. The gas is produced by a simple and not costly apparatus for distilling shale oil or any fatty material. It is then purified, compressed to the extent of ten or twelve atmospheres, and stored in metal cylinders. A supply sufficient for use during thirty or thirty-five hours is, as required, taken into light wrought-iron holders, at about six atmospheres' pressure, fixed beneath the carriages. The cylinders are provided with an ingenious arrangement by which the pressure is regulated and equalized, and the gas allowed to issue and supply the burners. The gas is burned through a small fish-tail burner placed beneath and close to a convex reflecting surface of white enamelled iron, in which a small slot is made to admit of the passage of the heated air to the chimney. The necessary atmospheric air enters through the lid of the lamp. The construction is such that no gas can find its way into the interior of the carriage, and the light can be modified at pleasure without being extinguished. Each carriage can be separately fitted with all that is necessary for illumination; the light is perfectly under control, and the weight and bulk are unimportant. The system has been adopted by some twenty-three railway companies in Germany, is in use in the imperial travelling post-offices, and is to be found in the saloon carriages of the Emperors of Germany and Russia. In England it has been used for two years (somewhat penuriously, perhaps) in the carriages of the little branch line running from Baker Street to St. John's Wood, and is in course of adoption elsewhere. The saloon carriage used by the Prince of Wales is already furnished with this light, and on a recent occasion the gas remaining in the holders after a previous journey was found at the end of three months to be as good as ever, and more than sufficient for the next trip. This gas is manufactured at present at the rate of 16s. 8¾d. per 1,000 feet, and the consumption per light per hour is 0.5,983 of a cubic foot. Coal gas, which will not bear compression, is in use on the Metropolitan and District Railways, and costs only 3s. 9d. per 1,000 feet; but its consumption is, in round numbers, at the rate of 4 feet per hour instead of 6-10ths of a foot. That is to say, it takes 6,500 feet of coal gas to do the work which 1,000 feet of the Pintsch gas accomplishes, at a cost of £1 4s. 4½d. for the former as compared with 16s. 6d. for the latter.

With regard to floating lights, it is proposed to make the buoy itself the recipient for containing the compressed gas, with its regulator (which is one of the most important points of the invention), and the lantern at the top of a short conducting tube. A buoy of ordinary size will burn about three months, night and day, with only one filling, and the light is visible at a distance of about four miles. There is, however, in existence an electric lighting apparatus which might be employed, so that the light could be extinguished at sunrise and restored at night, giving, of course, a much longer duration to the working of the buoy. It will be interesting to see the result of this experiment, as the success of the scheme would be a boon to navigation out of all proportion to the increased comfort of a few benighted and betunnelled railway travellers. — *Pall Mall Gazette.*

PUBLICATIONS RECEIVED.

THOUGHTS ON ARCHITECTURE. Its Literature and Practice. By Geo. C. Mason, Jr., Fellow American Institute of Architects. Newport, R. I.: Marshall & Flynn, Printers, 1879.

ADDRESS AND MEMORIAL in Opposition to the Bill (S. No. 300 and H. R. No. 1612) "To amend the Statutes relating to Patents and for other Purposes." Read before and adopted by the Cincinnati Board of Trade, December 18, 1878. Cincinnati: Times Book and Job Printing Establishment, 1879.

THE ILLUSTRATED WOOD-WORKER, for Joiners, Cabinet Makers, Stair Builders, Carpenters, Car Builders, etc. Monthly. Chas. D. Lakey, Publisher, New York, 1879.

NOTES AND CLIPPINGS.

Iron Working Improvements. — An English inventor proposes to prepare from iron a hydrated peroxide by forming heaps or beds of the metal, and keeping it moist with water of a saline solution, and in some cases he hastens the oxidation by the use of a galvanic battery. He takes the hydrated peroxide thus obtained and reduces it to a fine powder. He places at the bottom of a crucible a quantity of the oxide, and over it places cast iron; the crucible is then heated in a furnace until the iron is melted, and as soon as the oxide has acted sufficiently the metal is cast into ingots. These ingots are employed in the manufacture of steel by remelting them with steel or iron scrap, according to the quality of resultant required. This hydrated oxide is also used with good effect in puddling furnaces, being spread over the bottom, and the iron melted and worked over it.

The Catalpa Tree. — Mr. E. E. Barney, of the Barney, Smith & Co. Car-works, has for a number of years been engaged in investigating the relative qualities of different species of woods, for the purpose of obtaining a wood suitable for railroad ties, that would stand the weather better than those now in use. His investigations have led to an intimate knowledge of the catalpa tree, a tree that grows readily in most climates and develops an extraordinary durability. He has specimens of the tree that have been in the ground in dry soil for fifty and sixty years respectively, and show but very little signs of decay. Some time ago Mr. Barney received a letter of inquiry from Sir Joseph Hooker, the eminent naturalist and manager of Kew Gardens, London, requesting information as to the catalpa, and some seeds and samples of the wood. He had seen the results of Mr. Barney's experiments, and felt a great deal of interest concerning them. Similar letters have also been received from officers of the queen, in Australia and New Zealand.

A New Fountain. — Mr. Henry L. King, who recently died at Albany, has made a bequest of $20,000 for a public fountain to be erected in Washington Park, in that city.

A Curious Tree-Growth. — An exchange states that a singular phenomenon is noticed at Greensburg, Indiana, the county seat of Decatur County. In 1870 a green plant was seen sprouting from a crevice in the court-house tower, which could not be easily reached, and has since grown into a fine silver maple tree, which is at present twelve feet high and three inches in diameter. It can be seen for many miles around, and trains have been stopped by accommodating conductors until the passengers could see the wonder. The rapid growth of the tree is forcing the stones apart, but the people will not permit it to be removed yet.

Why Kerosene Lamps Explode. — Professor R. C. Kedzie, M. D., President of the State Board of Health of Michigan and professor in the State Agricultural College, lately delivered an address before the Michigan Legislature, in which he explained the manner in which kerosene lamps usually explode. He said: "Some persons seem to think the explosion of a kerosene lamp is caused in the same way as a boiler explosion; namely, by the pressure of the vapor of the oil inside the lamp. In rare instances explosions may be caused in this way; for example, where the ignited oil overflows the lamp and the lamp is enveloped in flame. But explosions usually occur in another way; namely, where the vapor of kerosene is mixed in proper proportions with air, and thus a true explosive mixture is formed, which will explode with the force of a gunshot when fired by flame. This explains why a lamp is in more danger of exploding when only partially filled with kerosene, because a larger amount of space is filled with the explosive mixture; it is the same as a larger load of powder in a gun. Many persons suppose that there can be no danger of a lamp explosion unless the whole body of the oil in the lamp is heated to the flashing point; that because the temperature of our rooms never rises to 120° there can be no danger in using oil whose flashing point is 120°. But Dr. Baker, secretary of the State Board of Health, has proved by experiment with lamps that an explosive mixture may form and the lamp may explode while the body of oil in the lamp is not above 85° F. The temperature of the body of oil in the lamp is not the only factor to be considered, because different parts of the lamp become very unequally heated. If you will touch the brass collar of a lamp which has been burning for some time you will find it quite hot, and the tube supporting the wick is still more strongly heated. The formation of vapor will be determined by the hottest part of the lamp which comes in contact with the oil. When the combustion is imperfect from any cause, the brass fittings of the lamp become excessively heated. Dr. Baker found in his experiments that when the chimney was removed, by breaking or otherwise, and the lamp continued to burn, the temperature of the brass collar rose very rapidly in every instance; in one case in 14 minutes it rose to 161°, and in another case in 10 minutes to 155° F. In this last instance very rapid explosions occurred by the side of the wick, and to prevent the whole lamp from exploding the light was extinguished. In none of these experiments did the temperature of the body of the oil rise above 85° F. Many persons on leaving a room 'turn down the lamp' to save oil, but such economy is very liable to cause a lamp explosion, which is anything but economical. I know of a case in Charlotte which illustrates the danger of this practice. A lamp in a store was turned down during the absence of the clerk; a person passing saw the lamp explode, and by promptly breaking open the store he extinguished the fire. If a light is not needed in a room either extinguish the lamp or leave it burning with the usual blaze."

Wood-Staining. — Wood may be stained *brown* by a concentrated aqueous solution of permanganate of potash; *red*, boil one fourth pound of logwood and one half ounce of soda in one pint of water, apply it hot, and then wash it over with a strong aqueous solution of alum; *rose*, iodide of potash in twelve parts of water for a first coat, and corrosive sublimate in forty parts of water for a second; *blue*, indigo solution, or a concentrated hot solution of blue vitriol, followed by a dip in a solution of washing soda; *yellow*, turmeric dissolved in wood-naphtha, or aqua regia in three parts of water; *green*, verdigris dissolved in four parts of water. — *Fortsch. d. Zeit.*

Flooding the Sahara. — M. de Lesseps, who has lately made a visit to Tunis, says that the Arab chieftains of the south of the Aures keep up the tradition of there having existed in former times a sea in that neighborhood from five hundred to six hundred leagues in circumference. He also has been enabled to disprove the idea that the formation of a new lake would do away with the oases, for he has discovered that these are all from fifteen to forty metres above the level of the sea, whereas the desert itself is below that level. Traces of Roman civilization have been found in the desert, and among them the remains of an amphitheatre like that in Rome.

The Great Hungarian Tunnel. — On October 21 the great Josef adit at Schemnitz in Hungary was opened. The works have been carried on since 1872, the Hungarian government granting £10,000 a year toward them. The adit is over ten miles long, being some 50 yards longer than the Mont Cenis Tunnel. The total cost of the undertaking was £459,900; it was carried out entirely by Hungarian enterprise, and partly with Hungarian machinery.

The Oldest Obelisk. — Next after the greatest, it may be in order to notice the oldest of the existing obelisks. This is the one close to the modern village of Matareeah, or the site of Heliopolis, in the land of Goshen, near Cairo. A single perpendicular line of hieroglyphics ornaments each side and records its erection by Osirtasen I., or probably about B. C. 3000. The inscription, with one slight exception, is the same on all sides. A myriad of wasps' nests now completely obscure the carvings on two of the surfaces. Authorities differ regarding its height, but sixty-eight feet two inches is given as the latest measurement by Mariette Bey. Nearly six feet of the length is buried in the accumulation of soil deposited by the Nile; and the stone, even at the surface of the ground, presents sad evidences of the destruction caused by repeated visits of the water. The opposite sides only are equal, the measurements at the base being 6 feet 1 inch and 6 feet 3 inches. Pococke gives 6 feet and 6 feet 4 inches as his finding in the same connection. The southern side of the shaft is the best preserved, while the western is in the worst condition on account of having scaled to a height of about fifteen feet. This obelisk is supposed to have stood at the entrance to the great Temple of the Sun. Remnants of the temenos or enclosure of this sanctuary still remain. — *Brooklyn Union-Argus.*

A Spanish Kitchen Fire-Place. — In connection with the papers on "The Open Fire-Place," which we are now publishing, the following description of a Spanish kitchen fire-place may not be without interest. It is given in the words of an English traveller, Major J. S. Campion: —

"Almost in the middle of the room was a rough hearth, about four feet square and a foot high, and composed of tiles, flat stones, pieces of iron, — anything that would not consume. In its centre burned a fire of three sticks laid star fashion, with a blazing brushwood heaped on them. Around stood, with different messes stewing in them, a goodly number of pottery pipkins and utensils, in shapes and patterns identical with the Roman ones in use before Christ. A large wooden hood, supported by massive rafters, caught and conducted such portion of the smoke as did not circulate about the room to a hole in the roof, furnished with a rough louvre, through which it escaped, and from a cross iron of the hood hung a stout chain, terminating in a hook, by which was suspended a large pot full of potatoes slowly simmering. In a corner stood a primitive-looking casserole range, for cooking with charcoal in little hollows."

Hazing in French Ateliers. — Hazing among students of Gérôme and Cabanel in Paris has features worthy of an American college of twenty years ago. A Maryland lady sends the *Tribune* an account of the recent case which she received from an American art student now in Paris. A fellow-student of his had just succeeded in entering with Gérôme, and had begun work in the studio, when one day he was sent out with other new students to buy bread and wine for the older ones, which is the custom in Paris. On their return, a number of students from Cabanel's studio tried to take the bread and wine away from them, and succeeded in taking possession of one student and capturing his bottle of wine. In return for this indignity, a reinforcement from Gérôme's studio went into Cabanel's and tied ropes to one of the students, dragging him over the floor into their own room, when they threatened to paint him if the bottle of wine was not returned. At last he consented to pay for the wine. This made the students very hilarious, and they gave forth loud shouts, and banged at the doors with vigor. The noise aroused the directors of the studios, who came in, and after explanations it was ordered that the place be closed. There was terrific shouting and yelling from the Frenchmen after hearing this. In a few days some further disturbance occurred, and on December 3, Cabanel's studio was ordered to be closed for two months and Gérôme's for three weeks.

Labor and Material in 1822. — The memorandum book kept by the Friend who superintended the building of the Indiana Yearly Meeting-House in 1822 furnishes the following items, which show the differences in prices in some things then and now: —

Paid Reuben Bently for quarrying stone, five days in the water, $2.50.
Paid Thos. Owen for 1 keg 10d nails, $12.90.
Paid Edward Frost for 1 keg 4d nails, $16.56¼.
Paid Wm. Cox $2.10 [$210?] for 50,000 bricks, delivered on the grounds.
Paid Nathan Leonard the same amount for the same number of bricks delivered.
Paid Jas. Morton for 210 bushels of lime, $12.62½.
Paid Zimri Cook $55.06¼ for 817 pounds of iron.
Paid Wm. Scott for 2 days' work painting, $1.
Paid John Wright $9.31¼ for 90 pounds of putty.
Paid Wm. Dunham $95 for finding material and plastering meeting-house.
Paid Wm. Putman $7.30 for 27 days' work.
Paid Joshua Cox 12½ cents for sweeping the roof of the meeting-house.
Paid Lewis Morrow $4.50 for two weeks' work making mortar.
Paid John Pool 56¼ cents for 2 days' work.
Paid Joshua Bond $44.06¼ for 7½ gallons of oil. — *Exchange.*

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, FEBRUARY 1, 1879.

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ONE of Mr. Hamerton's books begins with an essay in which he maintains that certain artists should write on art. If the sympathizing friends who have subscribed to recoup Mr. Whistler for the costs of his suit against Mr. Ruskin had persuaded him that certain other artists should not write at all, his standing before the public might have been the better for it. But Mr. Whistler has been writing a pamphlet apropos of the suit, in which he pours vials of wrath on Mr. Ruskin and all critics, and the most of which, it must be said, is rather disordered declamation. He complains that the newspapers have missed the point of the trial, seeing in it only a personal matter. Mr. Whistler takes a larger view. "The war," he says, "of which the opening skirmish was fought the other day in Westminster, is really one between the Brush and the Pen; and involves literally, as the Attorney-General himself hinted, the absolute *raison d'être* of the critic." To the prosecution of this war Mr. Whistler devotes himself with enthusiasm, beginning naturally at Mr. Ruskin, thus: —

"We are told that Mr. Ruskin has devoted his long life to art, and as a result is Slade Professor at Oxford. In the same sentence we have thus his position and its worth. It suffices not, Messieurs! a life passed among pictures makes not a painter — else the policeman in the National Gallery might assert himself. As well allege that he who lives in a library must needs die a poet. Let not Mr. Ruskin flatter himself that mere education makes the difference between himself and the policeman when both stand gazing in the gallery. There they might remain till the end of time: the one decently silent, the other saying, in good English, many high-sounding empty things, like the crackling of thorns under a pot — undismayed by the presence of the masters with whose names he is sacrilegiously familiar; whose intentions he interprets, whose vices he discovers with the facility of the incapable, and whose virtues he descants upon with a verbosity and flow of language that would, could he hear it, give Titian the same shock of surprise that was Balaam's, when the first great critic proffered his opinion."

The war should be a war of extermination. "No! let there be no critics," he adds, "they are not a necessary evil, but an evil quite unnecessary, though an evil, certainly. Harm they do, and not good." One class of critics should remain, however, — literary critics, — to prey upon each other; but the critic and sole authority upon painting should be the painter. That Mr. Ruskin is not an artist Mr. Whistler does not condescend to argue. He assumes it as a fundamental and incontrovertible fact, and he gives him his *coup de grâce* in this alliterative way: "Let him resign his present professorship, to fill the chair of ethics at the University. As a master of English Literature he has a right to his laurels, while as the Popularizer of Pictures he remains the Peter Parley of Painting."

THERE is a great deal of foolish writing about art, and most of the current criticism is of that kind, no doubt. Like other foolish things it is undesirable; but it is mostly written in water, and we doubt if it has much direct effect on art. In one way it has its effect unquestionably, — that is, in filling the artist's pockets, so far as they are filled. If newspaper and other published criticism were suppressed, it is safe to say, the general expenditure in art would diminish rapidly. Mr. Ruskin might not be pleased to think it, but we doubt if any man in England has done more than he has done indirectly, by turning men's thoughts toward art, and creating a demand for it, to enable Mr. Whistler himself to ask two hundred guineas for a "nocturne." But there are critics and critics. Mr. Ruskin is an artist who writes on art, and it is just because he is an artist that he can make himself so disagreeable to other artists whose ideas are opposed to his. It is this that gives him the convictions, and the courage of them, that enable him to make his blows felt, and this that tells him where to strike. Without this his eloquence might have delighted the public, but it would not have disturbed artists, nor could it have greatly influenced contemporary opinion. But it was when he forgot to be a critic and descended to mere abuse that he most offended Mr. Whistler; as Mr. Whistler certainly forgot to be an artist when he composed this last arrangement in black and white.

THE conflagration season might be considered an inopportune time for proposing relaxations of building laws, especially in favor of an increase of building in wood. But the city government of Boston, as was mentioned in a communication to our paper last week, has before it a proposition of this kind. Within what is called the fire limit of Boston no wooden buildings are allowed: outside of it they may be built under some restrictions, but if they are for other purposes than dwellings they are not allowed to be more than fifty-two feet above their sills, and these sills must not be more than three feet above the street level. This works inconvenience in some districts of the city where the ground is uneven, and the surface of many building sites is more than three feet above the street, so that the owners, in compliance with the law, must either refrain from building or set their sills below ground. A permit was lately refused by the inspector to a person who wished to build upon sills eleven feet above the street grade. This refusal brought an amendment from a member of the common council which proposes to leave the level of the sills to the discretion of the inspector. At a hearing before the committee to whom the amendment was referred, there was naturally a remonstrance from the property-owners and residents in the endangered neighborhood, and from persons who are in favor of a strict building law, who urged the danger to the city of relaxing its instructions and the impropriety of submitting them to the discretion of the inspector. It was argued on the other hand that the law was nugatory, inasmuch as dwelling-houses were constantly built with sills above the required level. The question was left undetermined; but the impression prevails that the ordinances will be modified so as to confine the strict operation of the law to the original city limits, and give the inspector joint authority with the Committee on Surveys and Inspections to suspend its application in the annexed suburbs.

ONE is tempted to wonder somewhat both at the wording of the law, and at the apparent course of the debate on it in passing by what is after all the essential point in the whole matter, the speaker in behalf of the board of underwriters being apparently the only person who touched upon it. The law is badly drawn, but the method of improving it proposed in the amendment seems to be the poorest possible. The blunder in the law is in restricting the height at which the wooden construction begins, instead of that at which it ends. The one thing necessary in such cases is to prevent carrying wooden buildings high into the air, where, if they burn, they endanger their neighbors, and are hard to get at with water. When houses are near enough together to make restrictions necessary, the only safety is in a uniform rule. The only uniform level from which heights can be reckoned is the street, where the water and the fire-engines must be. The possession of an exceptionally high lot should not entitle a man to thrust a torch into the air, to the peril of those who surround him. To fix the height from the ground, as the speaker for the underwriters suggested, is not enough when irregularities of site give some houses commanding positions over others, or lift them out of efficient range of hydrants and fire-engines. The necessary restrictions should be accepted as the natural disabilities of a high site. These considerations, however, merely concern the height at which buildings stop, not that at which they begin. So long as they do not reach too high, the higher they begin — the higher their sills are set, that is — the better. At present the law virtually forbids putting basement or lower story of masonry under a superstructure of wood, a thing which it is desirable to encourage. If the Boston city government is anxious to lessen unnecessary restrictions without sacrifice of the public, we should expect it to authorize its citizens to begin their wooden buildings as high as they

pleased, but to insist on their finishing at the appointed level. The law might be framed so as to exclude exceptionally remote or isolated sites, without burdening committees or inspectors with a discretion which must provoke either personal ill-feeling or a lax administration. One would naturally suppose that an inspector would be glad to be excused from this invidious responsibility, yet we find the inspector of Boston pleading for it.

AT the same time, the exceptional costliness of the two recent large fires in New York has made the people of that city anxious, for the moment, at the danger they live in, and set them to meditating on the insecurity of great buildings with thin shells of masonry or iron, floored, furred, and finished with wood, and crammed with inflammable goods. They may reasonably be anxious, for they have thousands of acres of such buildings crowded together, only here and there broken by one which aims to be fireproof, while four miles and more of wooden sheds stretch over the piers that fringe the water line. It only needed a strong wind on the nights of the fires to convert a sharp warning into a terrible punishment. It is not strange that some of her friends hasten to remind New York that she is the worst built city in the world, which is perhaps true, as far as combustibility is concerned, if we except some of our Western towns, and such half-civilized cities as Constantinople and Cairo; without that limitation we probably need except only the domestic examples. Nor need we wonder that Chicago, against which the insurance companies have sharply discriminated since her great fires, should take this opportunity to retort upon New York, and declare herself the safer city of the two; or that the insurance companies should be frightened into increasing their rates, and some of those outside the city should begin to ask, as they have of Chicago, whether it is safe to insure there at all. Acknowledgment of the inferiority of our American modes of building is certainly making some progress, and we hear more frequent proposals for something better, even if the improvements are only of a half-way kind, such as solid wooden floors and the omission of furred spaces. But it is very difficult to get men to spare enough from their business capital to build solidly and permanently. When we have burned another city or two, or when we have so cut into our forests that wood has grown scarce and dear, there will be stronger incitements to reform; or if the rates of profit and interest on money should remain permanently lower than they were in former years, there will be inducement to put more capital into such permanent investments as buildings, because there will be less temptation to spare the uttermost farthing for active use. But a fever of speculation, such as is only too likely to follow any appearance of much improvement in business, would be a great check on progress in building.

AT present the best hope of improvement, next to the influence of architects, seems to be in the influence of underwriters. The burden of losses has been transferred to them, and it is this more than anything else, we suspect, which hinders safe building. If owners bore all the risks of fire, we may be sure that they would put more money into their buildings for the sake of avoiding it. When they can be secured against this risk for a moderate premium, the sense of danger which would be their chief stimulus to improvement being removed, they put the money where it will bring more profit. They will spend lavishly for show, because show is one of the profitable elements in their business; but not for security, because security has become the business of insurance companies. It is evident that the prevalence of insurance has not been an unmixed benefit. While it has shielded men in a great degree from individual hardship, it has undoubtedly increased the gross amount of loss by making them careless. The wholesome restrictions and discriminations which underwriters have established have done good, but they have not been sufficient to countervail the demoralizing influence of comparative security, or rather of recompense for losses. The insurance companies themselves are rather reckless. Competition is sharp among them, and they take unsafe risks. Every great fire brings down some of them; but the profits of their lucky years are tempting, and they swarm like bees. A great part of the controlling power has passed with the risks into their hands. They have already done something to bring about a better order of things: to them and to a gradual improvement of building laws we must look mainly for our future security. In the face of all this it is a poor time for laxity.

THE good old-fashioned theory that the unclean conditions of which malignant diseases are bred are confined to the squalid houses of the poor and vicious is badly shaken nowadays, when the rich and fastidious have provided themselves with special means of encouraging such diseases, which are in a measure out of reach of the poor. The experience of Mr. Rockwell's family, in Brooklyn, is a case in point. A millionnaire built himself a costly house on the Heights, and had it liberally plumbed. In two years since the house has been occupied nearly all the members of the family have been attacked with scarlet fever or diphtheria, of which Mr. Rockwell and one of his grandchildren have died. The theory of the Board of Health that the family had been poisoned through their drains proved most unpalatable to their neighbors, who have held their fashionable quarter to be exceptionally wholesome, and who naturally ask whose house is safe if Mr. Rockwell's is pestilential. But an inspection by the Board has shown reason enough for its theory. The house stands on the highest part of the Heights, in the region where the pressure of the gas from the sewers is strongest, and where the utmost precautions are required to keep the gas out of the dwellings. The house was provided with Jennings closets and set wash-bowls; each closet and wash-bowl had its trap, and the soil pipe was carried up through the roof, opening into the air. The house had its own drain, which dropped fifty feet vertically into the sewer in Furman Street below the Heights, and so far all seemed right.

BUT it appeared that between the house and the drain there was no trap, so that the drain and soil pipes formed together a high ventilating chimney for the sewer. The examination by the inspector of plumbing showed the water closets, which were hollow-plunger closets, depending upon the seals of the traps for security, to be so arranged that the traps were siphoned by the discharge, and probably remained unsealed most of the time. The soil-pipe carried up to the roof was used as a drain-water conductor, in which the downpour of a heavy rain was likely to siphon out all the traps. The traps of the various wash-bowls in the upper stories, connecting with one waste-pipe, had no air-pipes, and it was found by experiment that as the wash-basins were used they siphoned each other alternately. With all these opportunities it is probable that the gases from the sewer had tolerably free access to the house at any time, notwithstanding the opportunity for escape by the conductors, without which indeed the house would probably not have been habitable at all. Finally, an overflow from the main tank, from which more or less water was drank, was carried directly into the soil-pipe, and sealed only by bending its end down into the water, giving opportunity for constant absorption of sewer gas. It is probable that a thousand of houses, all over the country, which are believed by their owners to be faultless, are in no better condition than Mr. Rockwell's. But if this was the case with a house on which money had been spent without stint, and where the plumbing, like everything else, was intended to be of the first class, what is to be expected where second-class or third-class work is done, and crowded down by competition to the lowest limit of cost?

THE EXTRAVAGANCE OF CHURCH BUILDING.

WE find in an exchange a quotation from the *National Baptist*, touching a subject of much controversy between architects and their employers. Says the *Baptist:* "There is a most mischievous idea abroad in regard to churches. People talk about the duty of putting up a church that will be 'a credit to the neighborhood,' 'an ornament to the city,' and all that. And so a structure is put up that is grand for the neighbors who see it from the outside, and who don't have to pay for it; but it is a ruinous calamity to the people inside, who can't see, or hear, or breathe, and who find that in the effort to 'adorn the neighborhood' they have crushed themselves with debt, and have perhaps wrecked the whole enterprise. We are afraid that not a little of the blame lies at the door of the architects. We fear that not a few of our churches are erected to the praise and glory of Mr. Highspire, the eminent architect (just as not a little of the singing is to the praise and glory of the organist, the leader, and the choir). All very well if the architect pays the bills; but such is not usually the case. How true is it that there is one virtue which has survived the Fall: it is the virtue of being generous with other people's money."

Undoubtedly the extravagance of church building is a serious evil nowadays, just like all the common extravagance, of

which it is only one phase. Undoubtedly architects are tempted to extravagance in their expenditures, as other men are; and if they are intrusted, more or less, with the spending of other men's money the temptations to extravagance will show themselves there. Undoubtedly, too, there are a good many of them, as there are of every other kind of men, who are either injudicious, over-enthusiastic, or unscrupulous; and it will often happen that when they have full swing they will lead their employers into difficulty, just as other indiscreet or unscrupulous agents will. It is a popular mistake, however, to talk of architects as if they were exceptional in this respect, except so far as is due to the fact that their services directly involve the spending of money, or that they are exceptionally responsible for the mischief. So far as we can see, the extravagance of architects is only part and parcel of that in the communities in which they live, and of the clients who employ them. Their most expensive work is that which they find most admired; those of them who build most expensively are most sought after; and of the designs which they submit in competitions, other things being equal, the showiest usually carry the day. In fact the very word "showy," which to a trained taste is at once suggestive of offence, is one of the commonest that in the innocent frankness of ordinary speaking is used as a recommendation. The building of a handsome church, or other conspicuous building, is always urged as an advantage to the neighborhood; and conversely, people who have churches to build are anxious to put them where, to suit their surroundings, they must be handsome. In other words, fashion and the desire for display have invaded the sanctuary just as they have invaded every other place, and the architect who does not consult them will not be popular. It is true that church builders are averse to spending the money which the architect's splendors are apt to cost, and a little inclined to expect him to provide them without cost; but the splendors they will have, and will rather spend money freely — or borrow it — than forego them. It is not surprising, then, that architects, like other men whose services involve the spending of money, should be infected with this tendency, and should chime in with it, and since it belongs to them to lead the way should lead in the direction in which this points them. Among different architects it is quite possible for a church committee to select one who has a reputation for simplicity and economy of work, — at least if these qualities bring any reputation. It is always possible for a client to choose a practitioner who is known for the qualities on which the client sets most value. But we must sorrowfully confess that it is hard to count up architects who have risen to great popularity by conspicuous practice of the virtues we have mentioned. There are men who display them, but they are not those whom great success attends. There are cheap architects who are popular; but they are those who sacrifice substance to display, and their work is more extravagant in its kind than that which is both substantial and splendid.

There is no doubt that, in one respect, the architect is subject to an exceptional temptation. His artistic impulses are to the carrying out of conceptions which are more or less costly. These conceptions are among the things that most recommend him to his clients, and most enhance his outside reputation. To carry them out properly costs more than is commonly understood in a community educated to cheap work and cheap succedaneums; so that the client, committee, or church society that is captivated by the conceptions is apt to wonder at and resent the cost of executing them. The architect's instinct as a designer leads him to insist on details of execution of which the client does not see the meaning, though he may in the end unconsciously feel the result. The client may be bent upon an increase of expenditure in one place; the architect's sense of fitness tells him that this requires a corresponding increase in another where the client does not appreciate it, and they are at cross purposes. This leads to conflicts between the architect's business conscience and his artistic conscience, which call for a good deal of tact and self-denial. It is his embarrassment, too, that the things which tell most for his reputation are those that cost most money. This is the chief handle of such accusations as we have just quoted. It exposes him to the charge of seeking his own aggrandizement, though he may be only faithfully carrying out his ideal. It makes it difficult for the honest architects to disentangle the impulses of personal ambition from those of a genuine artistic instinct. There are many who, carried away by the desire to do a fine thing, are inconsiderate in this, and bring reproach upon their profession, no doubt; there are some who are unscrupulous. For these we have nothing to say, except that instead of the punishment they deserve they too often get the reward of success. But it is a mistake to cite them as representative architects, as it would be to call all physicians quacks, or to make the sensational preacher the typical minister. Mr. Highspire and the sensational preacher are both popular; but it is perfectly possible to distinguish both, and unnecessary to employ either.

Apparently there is a fallacy here, underlying the popular notion that holds the architect accountable for things of which not he, but the client, is the controller. The architect is not the keeper of his client's purse, nor of his financial conscience; he is only the spender of the allowance he makes. He has opportunities certainly to lead his client toward extravagance, but not to drive him to it. If his tendency is to spend money for his client, this is natural; for it is his promise to furnish the client with ideas, and an architect's ideas are in the nature of things not to be carried out without expense. He is not concerned to inquire too curiously into the condition of his employer's finances; but may assume that he knows his own business, and has self-control enough to stop where he ought. Not that the architect can hold himself emancipated from the consideration of cost; or is not bound to a conscientious care that his projects involve no waste, and a conscientious endeavor to keep within whatever limits of cost are actually fixed for him; or to refrain from persuading his client to expenditures that will lead to repentance; but the final responsibility rests where the final authority rests, — with the client, who is the naturally appointed guardian of his own exchequer. Of course, if architects carelessly allow their clients to be deceived, they are derelict; if they wilfully mislead them, they are dishonest; but the majority of architects are neither derelict nor dishonest. Perhaps the greatest cause of trouble is that clients — building committees especially, and, we are inclined to think, church-building committees most of all — always want more than their limit will allow: the rule is so general that it may be called universal. The architect is given a limit and several urgent requirements, and finds them incompatible; his question is which he shall sacrifice to the other. He is loath to offer a design which does not satisfy the requirements; clients or committees are apt to cling to them, and for the moment shut their eyes to the cost. As the work goes on the client's desires increase instead of subsiding. When at the end his eyes are opened again, and he finds himself burdened with what he has done, it is through a very common weakness of human nature that he is tempted to make the architect his scape-goat.

The charge of extravagance is one which building committees are not infrequently tempted to shift upon their architects, but it is not one that any class of men can in these late days very well afford to throw at any other. Architects are, we suspect, not more prone to the fault than other men. They have not the wholesome safeguard which their clients have, of being obliged to furnish the money that they spend, or rather that their clients spend by their advice; but on the other hand they have not, or need not have, the power to spend without their clients' consent. The practice of self-denial is not by nature palatable either to architects or to church societies. Architects have their temptations to lavishness, but one rather tires of hearing appeals of building committees for a vicarious thriftiness, just as one tires of hearing architects declaim against oppressions from these same committees which they might remedy themselves if they would.

THE OPEN FIRE-PLACE. VI.

EFFORTS TO IMPROVE THE DRAUGHT AND ECONOMIZE THE FUEL.

INTERESTING and beautiful as were these immense fire-places of the Middle Ages, they were open to the objection of being too expensive for ordinary use, both in first cost and in their extravagant consumption of fuel. For the majority of our modern rooms they would be altogether out of proportion in size, and about as much in place as would be a smelting furnace for a domestic oven, or the grand portal of a cathedral for the entrance of an ordinary dwelling. Their capacious throats engulfed huge quantities of air from the room, — much more than was necessay to support the combustion of the fuel,[1] — and, as this air could not conveniently be allowed them, where no economical means of warming it as it entered the room

[1] To support the combustion of say three kilograms of wood about thirty cubic meters of air are necessary, whereas we have seen by our Table I. that over eight hundred cubic meters passed up our small chimney. Thus over twenty times as much as is necessary to support combustion, and ten times as much as would generally be necessary for ventilation, are used even with our small fire-places.

was known, they smoked (as any sensible chimney would do under the circumstances), and the only way that could be imagined to diminish the smoking was to diminish the size of the fire-place opening. This diminution took place as has already been described, and the fire-place assumed its present economical proportions.

The chimney continued to smoke, however, and it was seen that the cure had not as yet been discovered.

The first recorded effort to study the matter seriously on a scientific basis was that of Louis Savot, a physician of Paris, born in 1579 and died in 1640. Savot made a study of architecture from a sanitary point of view, and having found in the smoky chimney an unusually troublesome patient, he set to work, like a true physician, to investigate the causes of the disease. But his success was only partial. The treatment he administered was quieting and salutary, but he failed to discover the real trouble and the secret of its cure. He improved the form of the fire-place opening by diminishing its width, so that less cold air could enter on each side of the fire, and he showed that the flue should be smooth to lessen the friction of the ascending smoke.

His is the first recorded attempt to save the waste heat of the smoke and the back of the fire. The famous fire-place at the Louvre, of which Fig. 29 gives the front elevation and Fig. 30 the section,

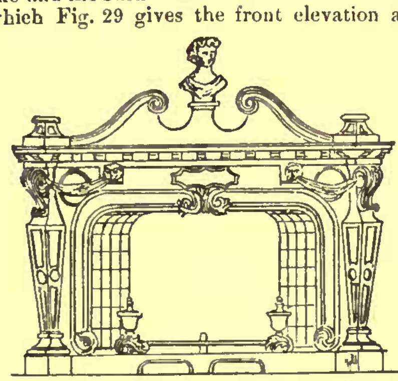


Fig. 29. From Tomlinson.

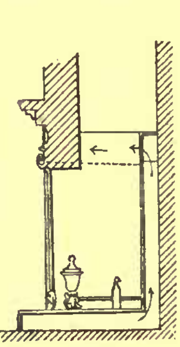


Fig. 30. From Joly.

was first brought into public notice by him, and shows the manner in which this was done. The room is warmed not only by direct radiation, as is usual with the ordinary fire-place, but also by the heat of contact of air. The air of the room enters the opening shown under the grate, passes behind the back of the fire-place and above the top, as shown by the arrows, and returns heated into the room through the round openings just under the mantel moulding. The ornamental bands passing in front of these openings appear to have been designed to deflect the warmed air upwards as it issued from them, and prevent its returning at once into the fire-place. To admit of this circulation of air the fire-place was, of course, made double as shown, and the inner box was made of iron. In this way a portion of the cold air at the bottom of the room was heated and tended to rise to the top, and a certain amount of heat was saved. This ingenious contrivance does not appear to have been appreciated or successful, though, since the time of Savot, the arrangement has, with slight modifications, been patented over and over again as a new invention. By it neither was the air of the room changed nor was the draught of the chimney improved, and the saving of heat does not appear to have been sufficient to bring about its introduction. A simple modification in the nature of its air supply, however, would have rendered this invention of the greatest value. By taking the supply of air to be heated from the outside instead of from the room itself, we have the principle of the so-called ventilating fire-place, hereafter to be described, and in consideration of its simplicity it would have formed one of the best of its class known. To secure the air-space below the hearth the fire was raised three or four inches above the general floor level. This rendered the fire more efficient in warming the floor of the room, inasmuch as a greater number of rays of heat would evidently strike the floor, and all at a better angle.

Fig. 31 shows, in section, another form of Savot's invention.

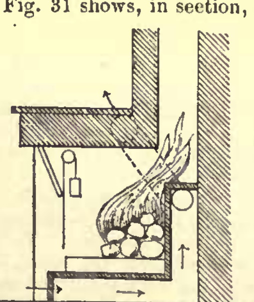


Fig. 31.

When the column of air in an upright flue is heated and becomes lighter than the surrounding air, it is no longer able to maintain its equilibrium with the colder and denser column outside, which therefore rushes into the house through the cracks and crevices, driving the warm air up the chimney until the balance is restored. If, now, these cracks are all closed, the cold air will force its way into the room through the chimney itself, descending on one side of the flue, while the hot air and smoke ascend on the other. A struggle will ensue between the two opposite currents, causing the cold air to enter spasmodically, or in puffs, bringing part of the smoke with it.

But let a separate inlet be made for the outside air and it will enter the room in a steady stream and drive the smoke smoothly and rapidly up the flue. In the majority of cases a smoky chimney may be cured by observing this simple law. The first really important step in improving the chimney draught, then, was made when this principle was recognized, and a sufficient opening provided for the admission of the outside air. The manner, however, in which the renewal of the air was at first accomplished was such as to improve the draught only at the expense of the ventilation of the room, as will be seen by examining the accompanying Fig. 32. It represents the apparatus of Sir John Winter, invented in 1658.

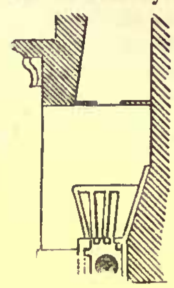


Fig. 32.

Fresh air was brought in under the grate from the outside and acted on the fire as a powerful blower. A valve was placed in the supply-pipe and by it the amount of entering air was regulated to the requirements of the fire. It will be seen at once that when the supply-pipe was large enough and the valve was opened the fire would be supplied with air entirely by this pipe, and all objectionable draughts through window and door cracks be effectually debarred. But it must also be borne in mind that by just as far as the draught was supplied from this source, by just so far would the ventilation of the room be reduced, and if the pipe supplied all the air necessary the ventilation would be nothing.

Fig. 33 represents the section of another form of the "blower" chimney almost entirely abandoned at the present day, but at the time of its invention much in vogue. The fresh air is brought in a canal from the outside and turned on the fire from above, passing between the two plates represented in section under the mantel. This has all the objections and none of the advantages of the blower of Winter. The ventilation of the room is destroyed; a cold current of air is produced in the neighborhood of the fire; and the point of delivery of cold air is not located favorably for stimulating the fire.

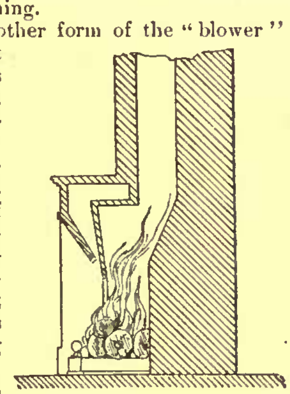


Fig. 33.

Still another form has been much praised, though without a shadow of merit. By it the fresh air is introduced into the room directly from the outside at the level of the floor, just in front of the fire-place, under a fender perforated for the purpose. The form of the fender is such as to direct the incoming air forward upon the fire as it enters. This is the worst possible form of fire-place; and besides having all the objections enumerated above is liable to clog with dirt, and is difficult and expensive to construct.

A modification in the *manner* of supplying the fresh air, so that it could be used to ventilate and warm the room before feeding the fire, would have rendered Winter's invention of the greatest value.

His contrivance was, therefore, also a failure, though it has, since his time, after having undergone slight modifications not affecting its general principle, been frequently patented as a new idea. It only remained to combine the inventions of Savot and Winter to produce most useful results.

THE VENTILATING FIRE-PLACE.

This combination was made, in 1713, by Gauger, the real inventor of the ventilating fire-place and, indeed, of almost all the most important principles of improvement in the form of the fire-place since the time of Savot. He gave the fire-place the elliptic form as shown in Fig. 34, instead of the square form hitherto used, for the purpose of improving its reflecting power. He showed that, with the rectangular jambs, very few of the rays of the fire are reflected into the room.

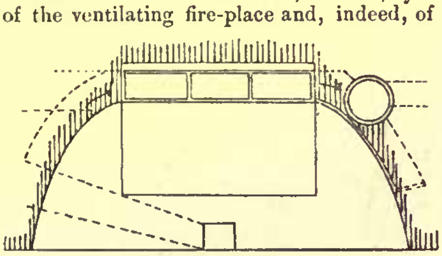


Fig. 34.

Thus, if we suppose a fire to be at F in Fig. 35, in an ordinary fire-place, only two of the rays represented by dotted lines as striking the jambs would be reflected into the room, the rest being thrown upon the opposite side or upon the fuel or back of the fire-place or up the flue. With the curved back, however, all the rays come into the room. "Geometricians," he says, "are sensible that all radii which set out from the focus of a parabola and fall upon its sides are reflected back parallel to its axis." So any ray

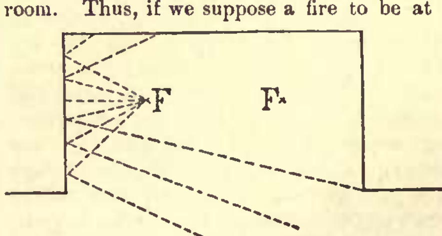
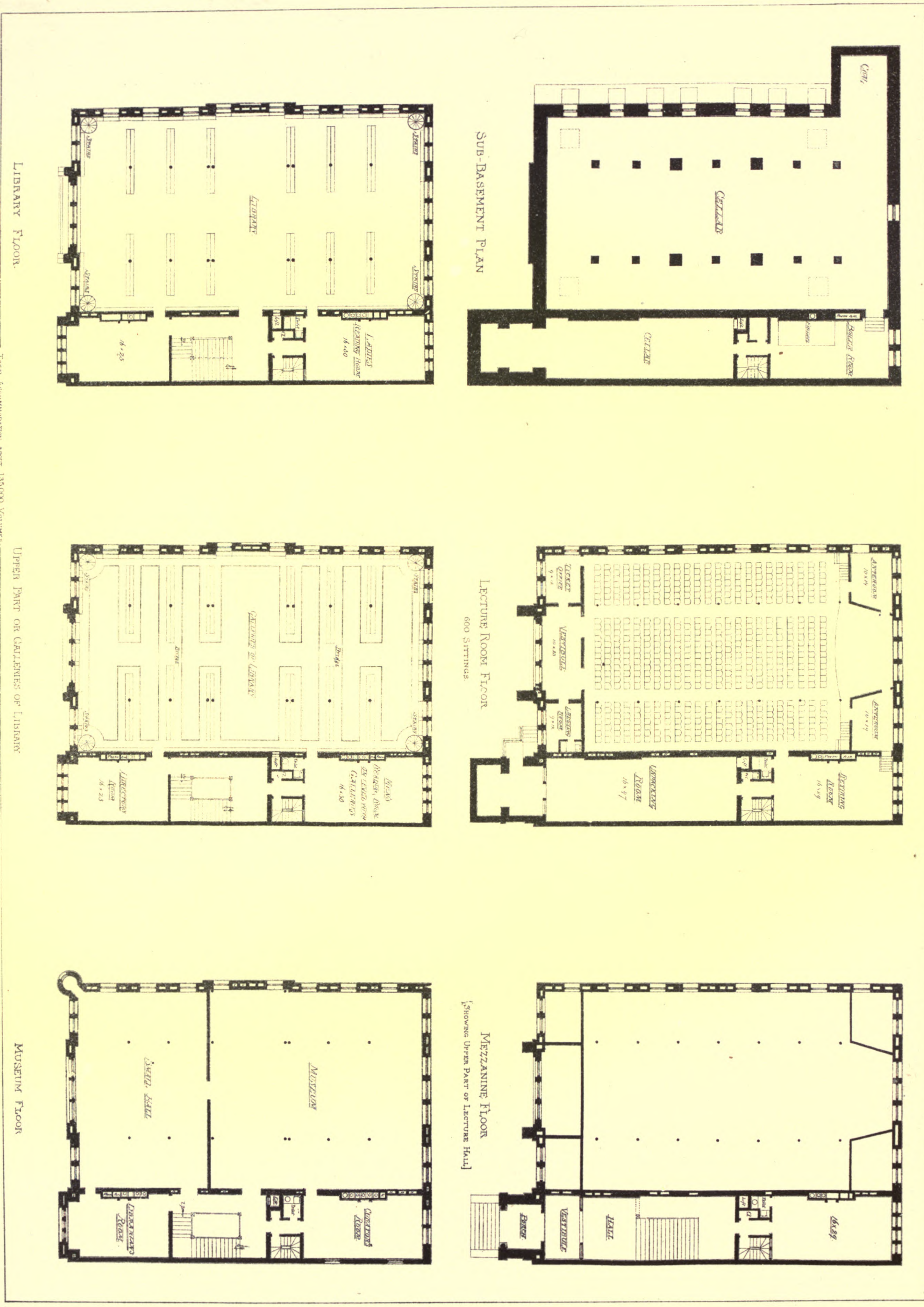


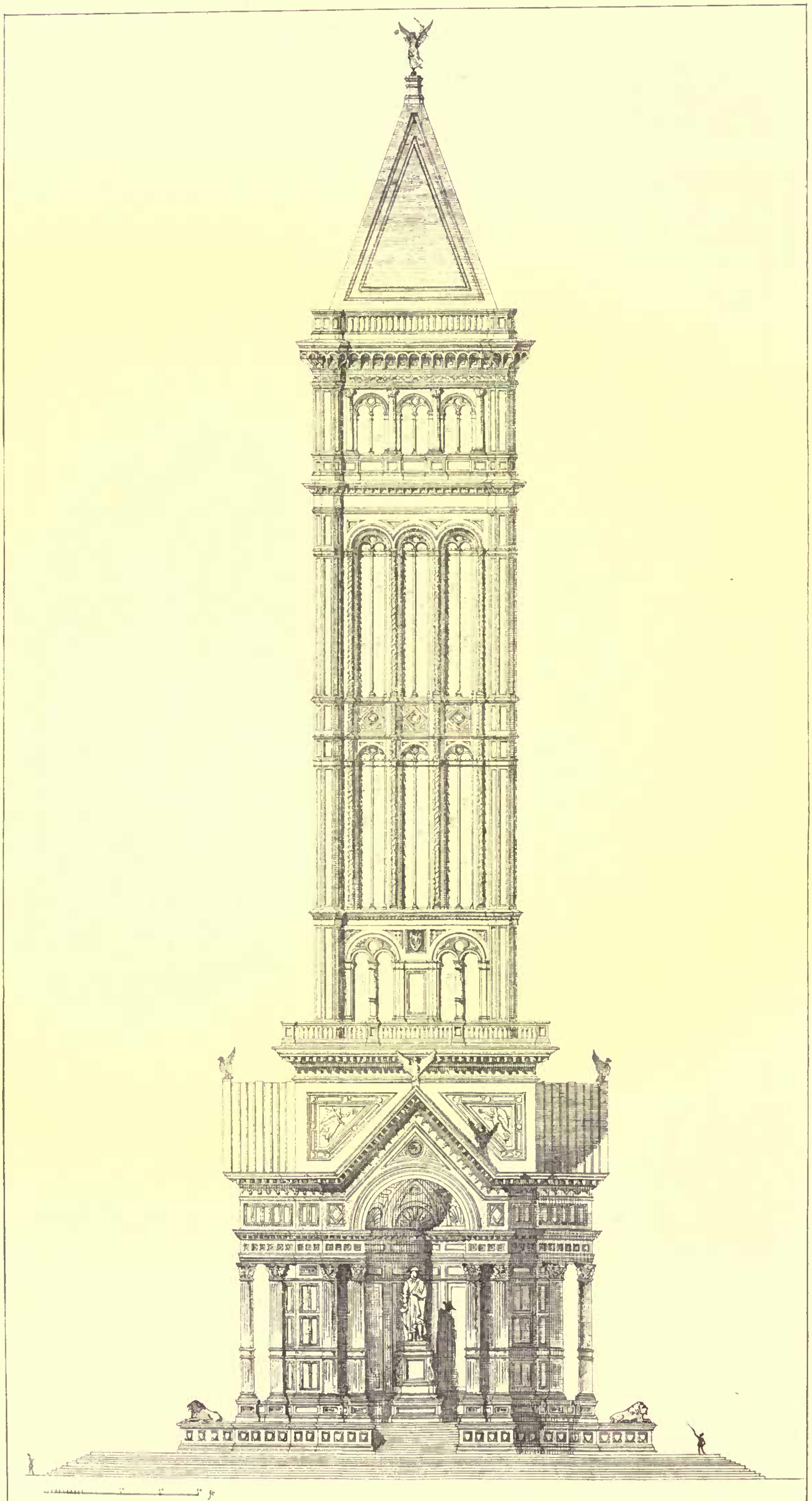
Fig. 35.



L. I. HIST. SOC. BROOKLYN, N.Y.

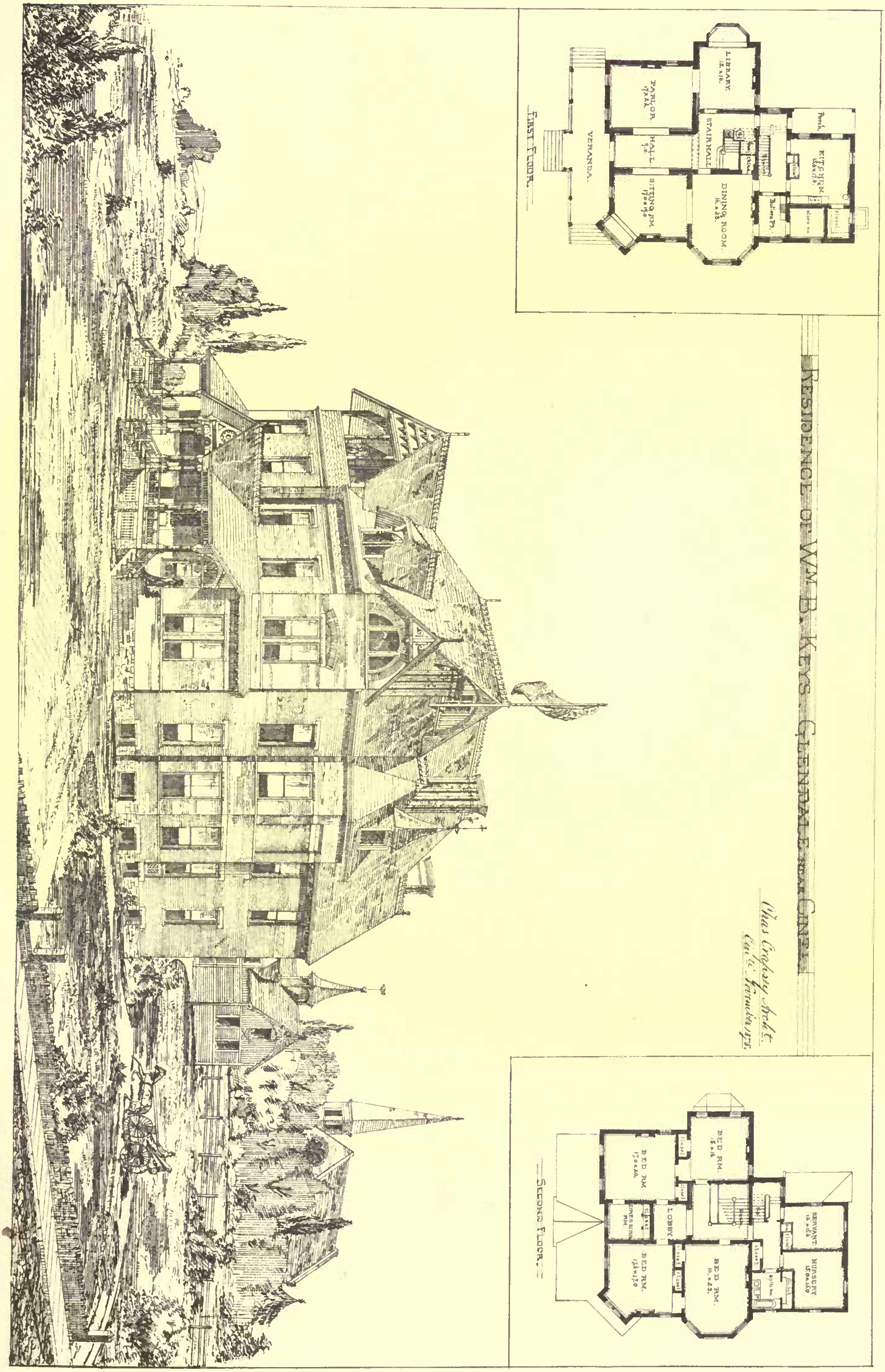
J. PICKERING PUTNAM, ARCHT.

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

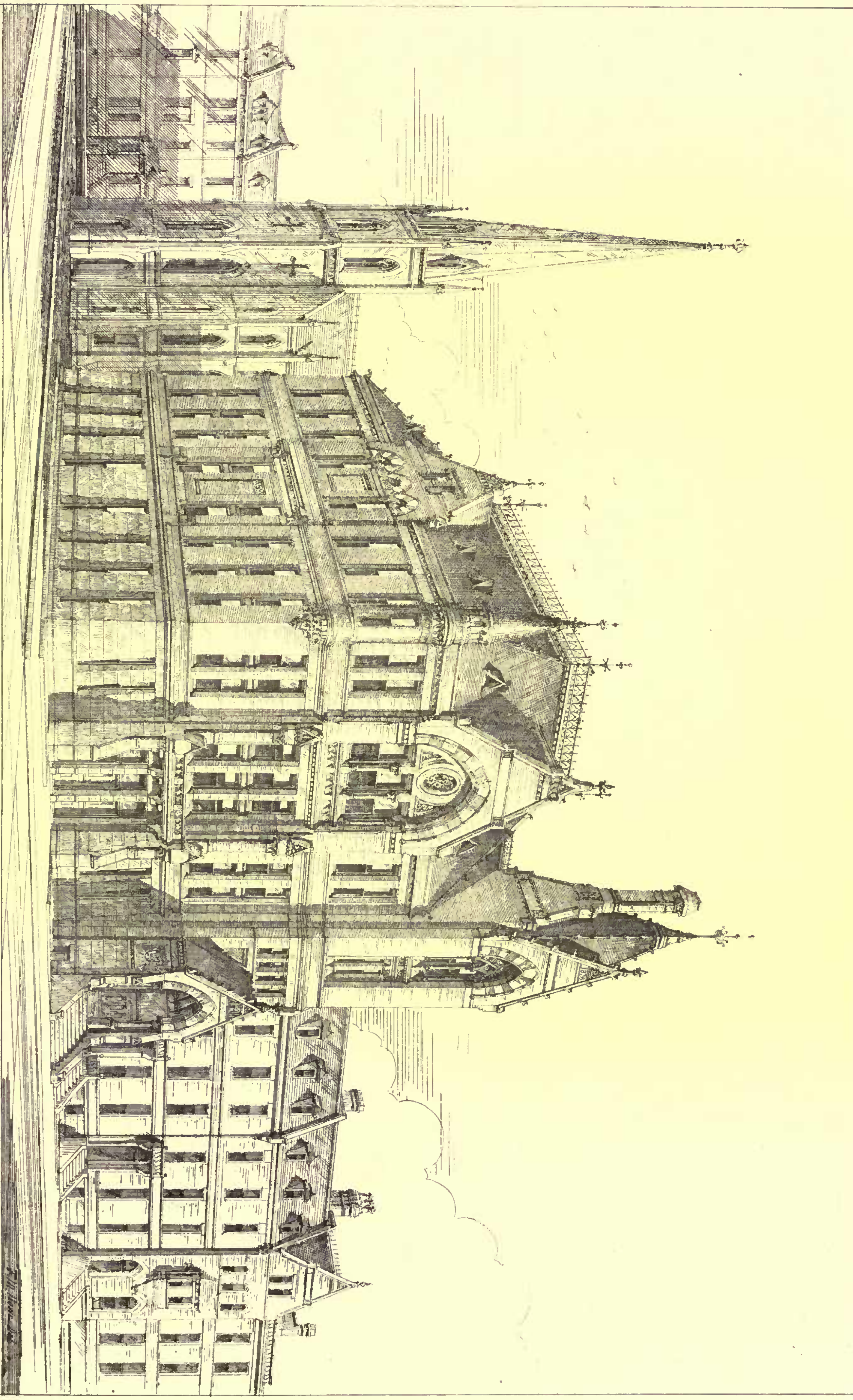


THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON.

MR STORY'S DESIGN FOR THE WASHINGTON MONUMENT



HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON



L. I. HIST. SOC. PERSPECTIVE VIEW J PICKERING PUTNAM, ARCHITECT.

THE HELIOTYPE PRINTING CO 220 DEVONSHIRE ST. BOSTON

falling from the fire or parabolic focus F or F′, Fig. 36, and striking the back of the fire-place, will come into the room. The same will happen to any ray coming from any part of the fire intermediate between the two foci F and F′.

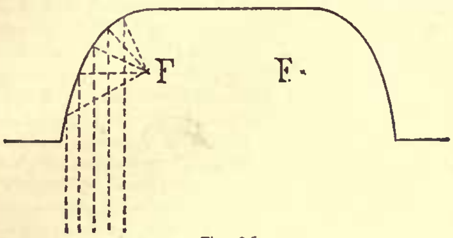


Fig. 36.

The fire-place of Gauger, besides the parabolic jambs and a small *soufflet*, or blower of Winter, had also, after the principle of Savot, hollow back, jambs, hearth, and mantel, for the purpose of pouring into the room a copious supply of fresh air heated in these hollow walls. But unlike Savot he brought the air direct from the outside for ventilation. These spaces were called caliducts or meanders, and are shown in Fig. 37. They contained perpendicular or horizontal divisions or baffles so arranged as to cause the air to circulate in the hollow spaces, in the direction of the arrows, as much as possible before entering the room.

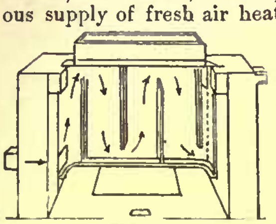


Fig. 37.

The temperature and amount of the fresh air introduced into the room was regulated by a valve in the air channel acting like a two-way water-cock. A small cylinder, Fig. 38, revolved within a larger fixed one in such a way that the cold air could be passed directly into the room, or first into the caliducts and thence into the room, or shut off altogether. The axis of the revolving cylinder passed through the cover of the fixed cylinder, and had a small lever attached to it by means of which it was turned by the hand into certain positions marked on a small dial. The caliducts were made of iron or brass. He preferred to place them only in the back of the fire-place, as shown in Fig. 34, leaving the sides solid and lined with metal.

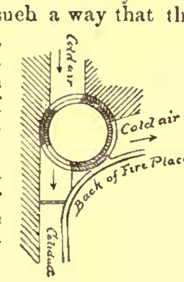


Fig. 38.

The object of the *soufflet* was to bring a small column of air directly under the fire to act as a blower in lighting it. The fire once lighted, the *soufflet* could be closed by a valve and all the fresh air turned into the room through the regular openings above. This fire-place of Gauger is the legitimate ancestor of scores of modern patents, whose authors are either ignorant of or have failed to acknowledge their descent therefrom.

In reading his work "La Méchanique du Feu," we see that the author was in want of a proper word to express his idea. The word "ventilation" did not then exist. Dr. Desaguliers, the translator of Gauger's treatise, was the first to use it.

The objection to the fire-place of Gauger is that it is somewhat expensive, and difficult to cleanse or repair when out of order.

To give the sloping back the parabolic form is almost too much of a refinement, and the *soufflet* is unnecessary where sufficient air is provided by the caliducts. Moreover, the hottest part of the fire-place is just above the flame rather than behind or at either side. Therefore the caliducts of Gauger do not occupy the most advantageous position with respect to the fire. By modifying these details and improving the form of the chimney-throat the arrangement might be made much more perfect. The external air, in passing through the caliducts, is, nevertheless, raised to a temperate heat, rises and spreads itself through the chamber, again cools, descends, and, after ventilating the room, supplies the fire with air, and escapes up chimney. The Gauger fire-places were constructed for the combustion of wood fuel. Dr. Desaguliers modified them for coal, and put up a considerable number of them in London. For a time they were appreciated and rose rapidly into favor; but, unfortunately, an outcry was raised against them by scientific opponents of Dr. Desaguliers, who declared that these fire-places "burnt the air, and that burnt air was fatal to animal life;" and the death warrant of the new fire-place was signed. When used again they appeared under a different name and protected by patent rights. The unfortunate Dr. Desaguliers mournfully remarked, "As I took so much pains and care, and was at some expense to make this arrangement of air useful, I can't help complaining of those who endeavored to defeat me in it."

SMOKE-CONSUMING FIRE-PLACES.

In 1682 the savants of Paris were attracted by the exhibition of the "Furnus Acapnos," (smokeless stove), invented by Dalesme.

It was simply a fire-place resembling a large clay pipe, Fig. 39, and its object was to consume its own smoke by causing it to pass downwards through the burning fuel before entering the chimney flue. In the ordinary fire-place a large portion of the fuel escapes unconsumed in the form of smoke which, in large cities like London, becomes a serious nuisance, hanging over the city in the form of a dark cloud, and filling the atmosphere with soot and impurity. To consume this smoke it is only necessary to bring it in contact with the glowing cinders of the fire, when it will at once ignite and give out its heat. The fuel, wood or coal, is placed in the vase over the grate bars. From the ash box below the grate bars an iron smoke pipe leads into the brick flue, which has no other inlet for air than through the fuel in the vase. The upper part of the iron smoke pipe is then heated by a lamp in order to establish a draught through the fuel. Brushwood is lighted at the top of the coal, and this, burning downwards, ignites the entire mass. The smoke of any new fuel supplied from above is consumed in passing through the glowing coals already ignited.

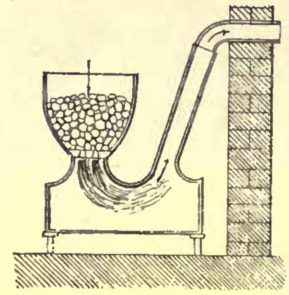


Fig. 39.

Justel, who described this arrangement to the Royal Society in 1681, says that "the most fœtid things, matters which stink abominably when taken out of the fire, in this engine make no ill scent, neither do red herrings broiled thereon. On the other hand, all perfumes are lost, and incense makes no smell at all when burned therein."

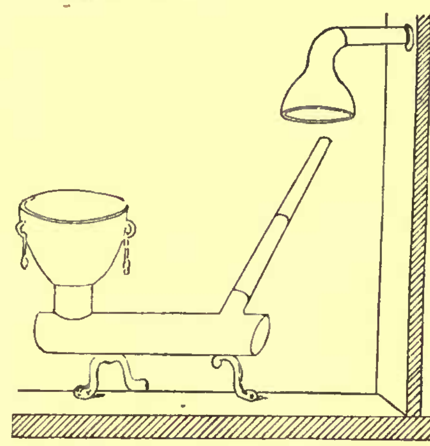


Fig. 40.

The invention of this device was claimed by a German named Leutmann, who called his fire-place "the "Vulcanus famulans," of which Fig. 40 gives the appearance.

But it is difficult to see how the draught could be effected in this machine, both on account of the break at the end of the iron smoke flue which would admit the external air, and on account of the small size of this flue. For these reasons Franklin gives it as his opinion that the invention not only did not belong to the German at all, but that he did not even understand the principle and working of the machine he claimed as his own.

THE ILLUSTRATIONS.

MR. STORY'S DESIGN FOR THE WASHINGTON MONUMENT.

WE print to-day an illustration of Mr. Story's design for the Washington Monument, which we described in detail in our last number. The design has already appeared in the Washington papers, or in one of them, and so we may assume that it is made public. Comparison with the photograph shows that through the negligence of the draughtsman, some of Mr. Story's enrichments have been omitted or slurred, a defect which takes something from the detail. But the desirability of printing the illustration while the interest of it is fresh prevents our waiting longer for a new drawing.

DESIGN FOR THE LONG ISLAND HISTORICAL SOCIETY'S BUILDING, BROOKLYN, N. Y. MR. J. P. PUTNAM, ARCHITECT, BOSTON.

This design was submitted last year, in a close competition, the successful competitor in which was Mr. G. B. Post, of New York.

DWELLING-HOUSE AT GLENDALE, NEAR CINCINNATI, O. MR. CHARLES CRAPSEY, ARCHITECT.

This house is now building for Mr. William B. Keys, at a cost of about $10,000. The material used will be brick with Ohio freestone finish, and the roofs, together with parts of the elevations, will be covered with Akron tile; the floors are deadened and the walls are furred.

CORRESPONDENCE.

AN AUDACIOUS CLAIM FOR EXTRAS.

NEW YORK.

THE Jefferson Market Prison and Court House seems to be enveloped with an atmosphere of litigation. It has been fought and wrangled over in public and private since the first mention was made of the intention to erect it, and Messrs. Vaux & Withers, despite the fact that the building is an artistic success, have gained little pecuniary benefit from it. The Cushing case will be fresh in the minds of our readers, where the stone carver found sufficient assurance to charge the most exorbitant prices, and supported his charges by making the most remarkable statements about the architects in their private relations. Just now the Court House is coming into prominence in the usual way through a dispute over a bill for extra work. P. K. & J. A. Horgan, the masonry and brick-laying contractors, took a gross contract for $116,885; at the conclusion of the work they presented a bill of extras for over $44,000, of which $30,000 were for delays attributable in nowise to anybody but the

contractors themselves. The usual examination of the bill of extras was made by the architects, and an allowance of $5,188 was made, and a certificate given for that amount in December, 1876. The contractors were not satisfied with this, and so represented matters to the comptroller that arbitrators were appointed, — Joseph M. Dunn, for the city, and Lawrence J. O'Connor, for the Messrs. Horgan. These gentlemen are architects, Mr. Dunn having built many buildings, asylums, etc., in the city, under the control of the Department of Charities and Correction. Mr. O'Connor has done much school and church work.

What examination they made of the case before them is not known, but it is certain that the arbitrator for the city did not call upon the parties from whom alone he could have obtained the information which was of value to the city. Finally a report was rendered which gave some $15,000 to the contractors instead of the $5,000 given by the architects. The consideration of the bills presented by the contractors showed some curious items. In a face wall of Philadelphia brick the use of the S-jointer was charged for, and this on 47,000 feet of wall face, when there were but 32,000 feet in the building. The bills of sub-contractors were ignored and thrown out of the account against the Messrs. Horgan, and the curious results which follow the least license to a contractor for a large piece of work were illustrated in a dozen different ways. Before the payment had been made, however, Mr. Withers heard of the report of the arbitrators; and now there is prospect of a ventilation of the case before the corporation counsel, and the Jefferson Market Court House spook will once more wander through a fire of litigation. W.

THE LOAN EXHIBITION.

Boston.

"Neither a borrower nor a lender be," said good Polonius with careful wisdom; but he lived not in the age of loan collections. The amount of borrowing that goes on before an exhibition like that of the Boston Society of Decorative Art, now in progress in Tremont Street, is something to wonder at. Here are some sixteen hundred articles, by the catalogue, illustrating more or less fully almost every branch of the purely decorative arts; every one of them acquired with more or less of triumphant satisfaction, through purchase, gift, or inheritance by its fortunate owner, and carefully guarded among the most precious of his possessions. That this multitude of small household gods should have been enticed away from their sacred cabinets into the public air on an exhibition to be seen of men is an evidence of devotion on the part of their owners as well as of enterprise on the part of the managers of the exhibition which ought not to go unrewarded.

The show is a pleasant and instructive one. An immense variety of objects has been brought together, of which it would be too much to say that all are beautiful or rare. Much of the catalogue indeed reads very like those which Messrs. Leonard & Co and their rivals send out from time to time to herald forth new opportunities for the collectors. But this is no reproach, considering the vast amount of Chinese and Japanese ware that has been poured in on our hungry community in recent years. And the great prizes do not often trust themselves to loan collections. But making all allowance for the extent to which people are now accustomed to the ordinary beauties of Oriental art, and subtracting from the collection all that is valuable only from association ("He in glory, America in tears," and that sort of thing), we have still enough left to invite and reward a minute and careful inspection.

The collection is curiously deficient in china and porcelain. With the exception of the Japanese and Chinese ware, which as I have intimated is much what we have seen before at the auction rooms, there are to be seen perhaps a dozen pieces of Sèvres, as many more of Dresden, a half dozen Delft bowls and plates, and a few very interesting examples of early English china, including Wedgwood, Worcester, Lowestofft, and a piece or two of old Fulham, of pale gray color, refined in form, carrying a floral decoration in low relief without variation of color. There are also some good examples of the curious Capo di Monte ware, with the decoration of figures in florid color, and in such high relief as in some cases to confuse the form of the piece. Similar in style, but superior in form and color, is the beautiful Giugri tankard, contributed by Mr. Briggs.

There is a small but fine collection of arms, carrying a curious fascination, — from the wicked-looking Malay creese (or kriss as it is spelled in the catalogue) to the elegant but no less deadly Italian rapier, from the rude lance of the Norwegian to the two-handed sword of the Chinese or the battle-axe of the Persian. What various forms of human strife and human passion do not these contrasting weapons suggest. Here they are, reposing innocently enough, after nobody knows what pathetic or horrible histories, on the tables and walls of a highly respectable and peaceable society for the encouragement of decorative art. Perhaps the most sumptuous weapons here shown are two swords taken from an Algerine frigate captured by Decatur in 1815. The scabbards are wonderful specimens of *repoussé* work, in silver apparently, and of admirable design.

The department of silver, snuff-boxes, and jewelry is extremely attractive, without containing many single pieces of unusual merit or great variety. The historical element comes out strongly in this department, — the Paul Revere tea-pots and milk-jugs and porringers, the Governor Hancock forks, the Peter Faneuil casters, the John Adams cider-mug, and more which I do not recall, reminding us that there were comfortable cakes and ale in the good old colony times when we lived under the king. Here is a good representation of the silver work of most of the European states, — tankards and spoons and cups and salt-cellars, from Norway, Russia, Poland, Denmark, and even Lapland, to say nothing of the nations with whose work we are more familiar. I remember with special delight two pieces of Vienna silver; the one a little pitcher, perhaps four inches high, with a *repoussé* decoration, the other a mustard pot of chiselled work; both pieces exquisite in form and in ornament. A good deal of curious old jewelry is also shown, much of it more curious than beautiful, and glad to help itself out by a close association with some emperor of China, or mummied king of Egypt, or at least some French queen or Italian countess.

In this department are perhaps a score of miniatures on ivory; a charming branch of portraiture now quite crowded out of existence by the all-pervading genius of photography. These include three or four portraits by Isabey and two or three by Malbone, which anybody may be glad of the opportunity to examine.

There is a department of Japanese art, distinct from the china ware, which comprises a most attractive variety of minor trinkets and *bibelots*, not easily classed, but which strikingly exhibit the curious ingenuity, the droll humor, and the unrivalled skill in workmanship of that extraordinary people.

Last on the catalogue, but by no means last in the consideration of the visitors, comes the department of laces and embroideries. This is full of interest and instruction, and lies, perhaps, more directly in the line of the work of the society than any other. The collection of laces, though not large, contains some exquisite examples of many of the most rare and delicate varieties of this most fascinating handiwork, of which the very names carry a certain poetic charm, as Rose point de Venise, Spanish Blonde, Brussels point à l'aiguille, etc., etc.

Among the embroideries which line the walls of the inner room are old and fine examples of Turkish and Persian hand embroidery, of Chinese and Japanese screens, the latter blazing with gold and color, of Spanish and other church vestments, and of domestic embroideries of various dates and styles. Among this last, the most striking and original are the work of Mrs. Holmes, which is all designed with a certain apparent carelessness and absence of study and forethought which makes the result quite amazing in view of its harmony of color and its pictorial effect These embroideries are in fact pictures, without pretending to be such. No. 59, for example, suggests a landscape, in which a brilliant crimson bush stands out in strong relief against a mass of dark although sun-lighted foliage. No. 69, again, suggests a river with a tangle of blossoms and reeds in the foreground and a verdant sloping bank on the other side. But if these were accused of being landscapes their author might well reply for them that they claimed to be nothing of the sort, but only "arrangements in crimson and green" or whatever. No. 68 is a panel of brown silk with a branch of milkweed with bursting pods, and a sombre evergreen bending over it. No. 66, a disc of pale-blue satin with a few brown branches and buds thrown here and there over it, is called Spring. In all these pieces, though they are not equal in effect, there is with all their dash a certain temperateness and knowledge which preserves them from that excess to which in less able hands this style would naturally tend. They are eminently decorative but could be seen to much better advantage singly and in position than among the crowd of other work.

Mr. Little also has several pieces here, more confessedly pictorial than those of Mrs. Holmes, an admirable panel of sunflowers, and another carrying a conventionalized projection of an apple-tree with foliage and fruit on a pale-blue silk ground.

This suggestive style, as it may be termed, is the modern fashion, I believe, in other arts than embroidery. In this view it is interesting to contrast the work of which I have just been speaking with the crape shawl, No. 119, in the same room, — a piece of exquisitely finished and delicate embroidery on a pale yellow ground, with a beautiful fringe, — or with No. 131, a piece of embroidery in colors a hundred years old, pale and faded, but extremely delicate and refined. A.

THE CINCINNATI BUILDERS' EXCHANGE AND THE LIEN LAW.

Cincinnati, O.

The Builders' Exchange, which has now been in existence about a year, has accomplished much good so far and is destined to occupy a position of equal importance with the Chamber of Commerce or the Board of Trade. The Exchange is now preparing very carefully a lien law, which it hopes to have in readiness for the present legislature to act upon. Each item being thoroughly scrutinized, the best legal advice is obtained on each point, with the hope and expectation that the owner, the head contractor, and the sub-contractor will be alike protected. The present lien law gives great dissatisfaction among sub-contractors, for the reason that all the courts, so far, have held that an owner cannot be made in law or equity to pay the same bill more than once, unless fraud is clearly proven between said owner and the head contractor. The courts hold that if an owner advances money in good faith faster than the contract calls for, in order that his house may be completed, the sub-contractors cannot look to the property for the payment of any claim they may have against it; and the claim among the sub-contractors is that no one of them has yet recovered anything under the present lien laws.

Hence the Exchange is at present in labor upon this matter. Let us hope it will bring forth a law comprehensive enough to protect all interested parties.

While upon this subject of the lien law it may be well enough to state another very serious objection to it, which is, that if it were literally enforced it would stop every building in the State of Ohio where a lien was filed, and no further work could be done on that building until all questions concerning the rights of the lien-holder were fully satisfied, which in accordance with the law's delays in this State would be likely to be three years.

One other peculiarity of the present law is that no two lawyers ever give the same opinion as to any of its clauses. A practice has been growing up in this city for some years past, which would, if unanimously agreed upon, settle, better than any laws can settle it, the whole question as to liens and the rights of sub-contractors. We refer to the movement looking toward the abolishment of the sub-contractor altogether, and letting the stone-mason, the brick-mason, the plumber, and what not deal directly with the owner. It does look strange at times that a carpenter who often has not one hundred dollars invested in his business, without even a shop, factory, or anything of the kind, is the responsible man for a $50,000 building, and the boss over men who have their tens or even hundreds of thousands of dollars invested. All money has to pass through the man of no means, and it is no wonder that much of it often sticks to the wrong palm. This movement would also be of benefit to the owner for the reason that it gives him the choice of the various mechanics, which right he does not possess under the old system. C.

COMPETITIONS IN INTERIOR DECORATION.

RULES AND REGULATIONS.

THE conditions under which we reopen the Competitions in Interior Decoration, which proved so interesting last year, are the same as before. These we repeat below for the sake of new competitors, and that old competitors may not have the trouble of looking up the rules and regulations.

1. The programmes will be published in the columns of this paper at least four weeks before the day on which the competition closes, and they will as before deal mainly with questions of interior decoration.

2. A first and second prize will be awarded to the best two designs submitted in each competition; the decision resting with a jury of three architects.

3. In awarding the prizes, heed will be taken of the manner in which the programme has been followed, the excellence and appropriateness of the design, and the execution of the drawing.

4. Each competitor is requested to sign his drawing with some motto or a simple device that can be recognized from its verbal description, and to inclose to the editors his real name and address, together with his *nom de plume*, on a half-sheet of note paper.

5. The designs to which have been awarded the prizes will be announced in the *American Architect*, the authorship of the designs being there indicated by the devices or mottoes only. The real names of the authors of the prize designs will be published at the end of the year.

6. The prize drawings and such others as seem desirable will, as before, be grouped on one of the regular pages of illustrations.

7. Only those designs will be published which in the eyes of the editors seem worthy. The order of publication of the designs is to be taken as in no way indicative of the decision of the jury.

8. Drawings which are received after the day named in the respective programme will be excluded from the competition, but not necessarily from publication.

9. The limits of the drawings must in no case exceed 16½ inches in length by 10½ inches in breadth. This space is to be inclosed by a frame composed of single lines only.

10. The scale of the several parts of each drawing should be indicated by a graphic scale.

11. Drawings may be sent flat or in rolls, by express or by mail. They will be returned to their authors at the end of the year.

12. For instructions as to the manner in which drawings should be prepared, competitors are referred to the instructions which are regularly printed in one of the columns of "building intelligence."

PRIZES.

The first prize will be

EXAMPLES OF ENGLISH MEDIÆVAL FOLIAGE AND COLORED DECORATION. Taken from Buildings of the Twelfth to the Fifteenth Century. With descriptive letter-press. By James K. Colling, F. R. I. B. A. 1 vol., large 4to, 76 plates and many wood-cuts, $15.00.

OR, ART FOLIAGE, FOR SCULPTURE AND DECORATION. With an Analysis of Geometric Form, and Studies from Nature, of Buds, Leaves, Flowers, and Fruit. By James K. Colling, F. R. I. B. A. 1 vol., large 4to, 72 plates, $15.00.

OR, GOTHIC FORMS (First Series), applied to Furniture, Metal-Work, and Decoration for Domestic Purposes. By B. J. Talbert, Architect. 1 vol., folio, 31 plates, $15.00.

OR, EXAMPLES OF MODERN ARCHITECTURE, ECCLESIASTICAL AND DOMESTIC. Sixty-four Views of Churches and Chapels, Schools, Colleges, Mansions, Town-Halls, Railway-Stations, etc. Erected from the designs of G. G. Scott, R. A., G. E. Street, J. P. Liddon, E. G. Paley, R. J. Withers, J. K. Colling, E. L. Blackburne, G. F. Bodley, E. B. Lamb, J. Johnson, E. I'Anson, and other eminent architects. From the latest English edition. 1 vol., 4to, $15.00.

OR, DISCOURSES ON ARCHITECTURE. By Viollet-le-Duc. Translated, with an Introductory Essay, by Henry Van Brunt, Fellow American Institute of Architects. Fully Illustrated. 1 vol., royal 8vo, half calf, $13.00.

OR, THE PICTURESQUE ARCHITECTURE OF SWITZERLAND, containing Designs of Country-Houses in several Swiss Cantons. Drawn and Engraved by A. and E. Varin. 4to, boards, $12.00.

The second prize will be

PAINTERS, SCULPTORS, ARCHITECTS, ENGRAVERS, AND THEIR WORKS. A Handbook. By Clara Erskine Clement. With illustrations and monograms. In one vol., crown 8vo, half calf, $5.00.

OR, NOTES AND SKETCHES OF AN ARCHITECT. Taken during a Journey in the Northwest of Europe. By Felix Narjoux. 214 Illustrations. 8vo, half calf, $5.00.

OR, A HANDBOOK OF LEGENDARY AND MYTHOLOGICAL ART. By Clara Erskine Clement. Profusely Illustrated. In one volume, crown 8vo, half calf, $5.00.

OR, THE ARCHITECTURAL SKETCH-BOOK. Vol. 1875, 4to, $6.50. 4to (6 mos.), $3.25.

OR, THE NEW YORK SKETCH-BOOK OF ARCHITECTURE. Vol. 1875, 4to, $6.50.

COMPETITION NO. I. — A LIBRARY WALL.

The programme for the first competition will be the treatment of the wall of a private library in a city house. This wall must measure 20 feet in length and 12 feet in height; it is to be pierced by a doorway, and may be decorated either by a large painting or by a statue of the Venus of Milo, while book-cases occupy as much of the remaining space as may seem desirable.

Required: An elevation of the side of the room, and details of the book-cases, including profiles of the mouldings, to a larger scale.

Drawings must be received at the office of the *American Architect* on, or before, Saturday, March 1.

NEWPORT SEWERAGE — A CORRECTION.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — In my communication concerning the sewerage of Newport (*American Architect*, page 23), I quoted Mr. Philbrick as having selected a point on Coaster's Harbor Island for the outlet of our main sewer. This statement I made on the authority of the chairman of the committee having the question in charge.

Mr. Philbrick says: "In my letter to the committee of the city government, last August, I stated most definitely that I was not sufficiently informed on the subject to form an opinion, and am at a loss to know whence you could have received such an impression as to justify you in quoting me as you have done."

This correction is the only amends which it is in my power to make. GEORGE E. WARING, JR.

NEWPORT, R. I., January 22, 1879.

WANTED, AN ANSWER.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Can any one inform us what expense the American Institute of Architects is under which forces it to call for an additional assessment? The writer, in common with all the Associates of the A. I. A., pays $7.50 per annum for which he has absolutely *nothing* in return. He is now politely requested to pay $4.00 more to pay for printing the proceedings of the annual convention, when his regular dues *should be* ample for the purpose. As a mere matter of right, he would like to know what is done with the money?

Respectfully, ASSOCIATE.

BALTIMORE, January 22, 1879.

[Inasmuch as the other communications on this subject have not evoked any official response from any one who is authorized to speak for the Institute, we venture to refer "Associate" to the *American Architect* for December 21, 1878, where we have given such explanation of the matter as we were able to suggest. — EDS. AM. ARCHITECT.]

ARCHITECTS' FEES.

EVANSVILLE, January 22, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — The columns of your paper have at different times contained interesting communications, in regard to the relations of architect to client, and considerable light has been thrown on many points heretofore in dispute. A case, however, showing how far, in many parts of the country, we still are from a perfect understanding with the public as to our claims and duties, has recently come to my notice. The circumstances are briefly as follows: A citizen of means gave to the people of this place certain lands, which were intrusted to a board of trustees composed of prominent men of the city, for the purpose of erecting a public library. An arrangement was made with a firm of architects, the terms of which the following copy of the minutes of the Board will perhaps sufficiently explain:

"On motion it was resolved to employ Messrs. ——, architects, and to pay them three and a half per cent on cost of the building, for plans, specifications, and superintending the building." Complete plans were prepared, and work was carried on, until the basement walls were complete, when the funds were exhausted, and further progress arrested. Nothing has been done now, for a period of nearly two years. The architects have been refused pay for the complete plans, on the ground that it is not due until the building is complete.

The question in dispute seems to be whether an architect is or is not entitled to pay for plans when completed: a matter of importance to all the profession, and any precedent or legal decision bearing on the case would be of interest to many of your readers.

Jas. W. Reid, Architect.

[There is no uncertainty as to the usage by which an architect's fee for his plans is held to be due when they are finished and accepted. According to the general custom, recorded in the schedules compiled by the British and American Institutes, the fees are due in instalments, — one per cent when preliminary studies have been accepted, two and a half when working plans and specifications have been furnished, and so on. Most architects do not make a separate charge for preliminary studies when their work goes further, but it is a recognized practice to render a bill for half the full fee of five per cent when the contract is signed. This is often waived when the work goes on continuously, especially if the fee is not a large one, the architect reserving his whole charge to the end, when the exact cost of the building is known. But it is fully understood that this is waiving a right; and there is no authority whatever for withholding payment for making plans, when the work is interrupted. It is not very easy to point out conspicuous examples of a usage which no one notices particularly because it is not disputed; but any architect of experience in cities where the profession is well established would be able to give instances from his own practice. — Eds. Am. Architect.]

PUBLICATIONS RECEIVED.

Report of Proceedings of the Board of State House Commissioners from Date of Organization to December 31, 1878, to the Governor of Indiana. Indianapolis. January 1, 1879.

Sanitary Engineering — Sewerage. A Guide to the Construction of Works of Sewerage and House Drainage, with Tables for Facilitating the Calculations of the Engineer. By Baldwin Latham, C. E., M. Inst. C. E., F. G. S., F. M. S., Past President of the Society of Engineers, etc. Second Edition. London and New York: E. & F. N. Spon. 1878.

NOTES AND CLIPPINGS.

Fall of a Snow-burdened Roof. — Taylor and Faulkner's flooring mill at Cincinnati was partially destroyed on the night of the 16th ult. Snow was on the roof at the time to the depth of about twelve inches, and a rain coming up during the night turned this snow into ice, which seems to have been the last straw that broke the roof. An examination of the roof shows it to have been constructed of wooden girders strengthened by hog chains. These girders ran across the building and supported the roof timbers which ran lengthwise with the building. It was the girders that broke, and the supposition of many persons is that the recent cold had so contracted the iron of the girder as to cause the accident when the extra weight of ice came upon it; this theory is helped out by the fact that the mill had not been running for some two or three weeks, and hence was not heated up. One peculiar incident of the mishap was that the centre building (the one in which the girders broke) fell against the north building, from which it was separated by a ten-foot alley, with such force as to throw over the east end of the north building The loss to the company will be about $10,000, which the insurance does not cover. The firm have begun already to rebuild the factory. No person was hurt in any way.

The Walled Lake in Iowa. — The greatest wonder in the State of Iowa, and perhaps any other State, is what is called the "Walled Lake," in Wright County, 12 miles north of the Dubuque & Pacific Railway, and 150 miles west of Dubuque City. The lake is from two to three feet higher than the earth's surface. In some places the wall is 10 feet high, 15 feet wide at the bottom, and 5 feet wide on top. Another fact is the size of the stones used in construction, the whole of these varying in weight from three tons down to 100 pounds. There is an abundance of stones in Wright County, but surrounding the lake to the extent of five or ten miles there are none. No one can form an idea as to the means employed to bring them to the spot, or who constructed it. Around the entire lake is a belt of woodland half a mile in length, composed of oak. With this exception the country is a rolling prairie. The trees must have been planted there at the time of the building of the wall. In the spring of the year 1856 there was a great storm, the ice on the lake broke the wall in several places, and the farmers in the vicinity were obliged to repair the damages to prevent inundation. The lake occupies a ground surface of 2,800 acres; depth of water as great as 25 feet. The water is clear and cold; soil sandy and loamy. It is singular that no one has been able to ascertain where the water comes from or where it goes, yet it is always clear and fresh. — *Dubuque Herald.*

Raphael's Madonna Conestabile. — Hitherto little has been known of the history of the beautiful little "Madonna and Child," by Raphael, now called the "Madonna Conestabile," which was bought by the Emperor of Russia, in 1871, from its Italian possessor. A writer in the *Allgemeine Zeitung* traces it from its first possessor, Alfano Alfani, a distinguished gentleman from Perugia, down to its last, Giancarlo Conestabile, who was obliged, by adverse circumstances, to part with this family heirloom. Since it has been in Russia the picture has been transferred from wood to canvas, a perilous operation, but this has been accomplished with successful results.

Pennsylvania Museum and School of Industrial Art. — The trustees of the Pennsylvania Museum and School of Industrial Art have held their third annual meeting to consider the yearly reports and to elect trustees. The original plan of the institution had been so developed as to place it upon a more solid and useful basis. The Industrial Art School made much progress during the year, the systems of free-hand and scientific drawing being particularly successful. The total admissions to the Museum were 15,738. The report closes by attacking the present style of teaching drawing in public schools. The report goes on to say that the absence of any systematic course of teaching drawing in public schools is a serious drawback to any effort in the direction of a higher art education. The trustees intend to urge the Board of Education to introduce a thorough course of drawing in the schools of the city. The receipts last year were $15,000, the expenses being $10,000. The subscriptions to the museum and school since their beginning have amounted to $58,000. The following officers were elected to serve for the year 1879: President, Coleman Sellers; Vice-Presidents, Edward T. Steel and William Platt Pepper; Managing Director, W. W. Justice; Treasurer, Clarence H. Clark; Secretary, H. Dumont Wagner; Trustees, to serve for five years, W. H. Merrick, H. C. Gibson, Thomas Cochran, N. Parker Shortridge; to serve for four years, Frederick Graef.

Versailles and its Bavarian Imitation. — King Ludwig's royal château, which he has set about building on the island of Herrenwörth in the Chiemsee, in Bavaria, after the model of the palace at Versailles, will find him, when completed, only forty-eight years old, and he has set apart fifteen years for the building of it. The 300 workmen now engaged in the work are lodged in barracks, temporarily constructed for them, and, by special order from the king, great care is taken to provide for their comfort and to satisfy their needs at a moderate expense. The *Telegraph* (London) observes that such consideration was not shown when Louis XIV. was building his Versailles. A writer has recorded that 36,000 men and 6000 wagons were engaged every day on that work, and Madame de Sévigné has said that a certain number of the wagons conveyed back to Paris at dead of night the corpses of those who had died during the day. In the memoirs of Madame Lafayette it is stated that large bodies of the royal troops were detailed to aid the laborers in the digging of the foundations, but that the unwholesome toil of excavating marshy earth sent every day scores of soldiers to the hospital. The beginnings of Versailles were of the humblest kind. Louis XIII., being much addicted to hunting in the Forest of St. Leger, grew tired of supping in dirty cabarets and sleeping in dilapidated windmills, and consequently resolved to transform a little pavilion which he possessed at Versailles into "a house of cards." It was his son, the Great Louis, who pulled down the "château de cartes," and bade his architect, Mansard, build in its stead a palace surpassing in extent and magnificence all the "stately pleasure-domes" that all the Kublai-Khans could ever decree. The present Ludwig, while wanting in the resources of his grandfather, the patron of Cornelius, Kaulbach, and Overbeck, evinces no diminution in the passion for building. In the mountains he has castles upon castles; he has builded and builded; and this new Versailles, while it may not lessen taxes or diminish the price of sausages and beer, will furnish employment for labor, whatever political economy may think of such methods of removing the burdens of a people.

Excavations in Rome. — The excavations in the valley of the Forum at Rome have now disclosed the whole of the Via Sacra between the Temple of Antoninus and Faustina and the Arch of Titus, with the buildings that lined it. Some of these buildings were already known; nothing, however, was known as regards the parallelogram between the Via Sacra, the base of the Palatine Hill, the Forum, and the Arch of Titus. A great mistake was made by old topographers, who placed in that narrow strip of land the temple and atrium of Vesta, the Regia, the Temple of Jupiter Stator, and the house of Tarquinius. The parallelogram in ancient days contained only a line of commonplace buildings of brick strengthened at the corners with blocks of travertine. The fronts of the buildings receded a little from the line of the street, and the space thus formed was filled with honorary monuments. Among these monuments are noticed the following: (*a*) A pedestal for a bronze statue, raised A. D. 339 by Fabius Tittianus, consul, and prefect of Rome; (*b*) a pedestal for a statue, raised A. D. 335. to Constantius, by Flavius Leontius, prefect of Rome; (*c*) a kind of small triumphal arch (or shrine) made at the expense of the inhabitants of Tarsus; (*d*) the pedestal of an equestrian statue, raised very likely to one of the Constantines; (*e*) some fragments of the *Fornix Fabianus*; (*f*) a fragment of the *fasti triumphales*, from the year 643 to 649; the victories mentioned are those in Macedonia, in Western Spain, and in Numidia, and King Jugurtha is expressly named.

The Channel Tunnel. — The site of the tunnel mouth of the Channel Tunnel on the English side, at St. Margaret's Bay, has been abandoned, and the work there has been stopped because recent surveys between that point and Sangatte on the French side proved that to cut a tunnel between those points would entail an enormous amount of work in sinking. The scheme now before the company provides for the sinking of a new shaft at or close to Dover. The site on the French side at Sangatte, near Boulogne, is still looked upon as the best that could be chosen for the commencement of the tunnel. The shaft sunk there is already 70 metres in depth, with a diameter of 2 metres, and the engineers consider that when they have got 10 metres further down the horizontal cutting may be commenced. The engineers of both countries agree that the French opening of the tunnel is the most difficult part of the undertaking, as a clayey soil has to be dealt with instead of chalk, and the incursion of water causes much trouble. — *The Iron Age.*

Artificial Marble. — Mr. William W. Wotherspoon states that he saw in Rome, three years ago, the exact process, as detailed in the London letter of the *Evening Post*, of making marble by subjecting soft limestone to steam-pressure. He gives the following as the ingredients of the bath to which the stone is subjected after its removal from the boiler: water, 2,000 kilogrammes; sulphuric acid, 33 kilogrammes; kaolin, 68 kilogrammes; potash, 17 kilogrammes.

The American Architect and Building News.

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BOSTON, FEBRUARY 8, 1879.

CONTENTS.

Mr. Vedder's quarrel with *L'Art*, following close upon the Whistler-Ruskin suit, gives fresh opportunity to study the rights and amenities of criticism. The editor of *L'Art* wrote to Mr. Vedder for permission to engrave and publish certain of his pictures. It is considered honorable to be illustrated in *L'Art*, and Mr. Vedder consented; but with the illustrations there appeared a pretty severe criticism of his pictures. This took Mr. Vedder by surprise; and he has published, as a protest in his own behalf and a warning to brother artists, a letter in which he states his case, saying that he assumed a request to illustrate his pictures to mean commendation, and should not otherwise have granted it, charging the editor with bad faith, and adding: "I do protest against this species of trap into which I have inadvertently been drawn, and wish to bring it to the notice of my brothers in art for their future benefit." There has been considerable newspaper discussion of the matter, in which Mr. Vedder has been taken to task for his attack. A writer in the *Evening Post*, among others, reads him a lecture, on the ground that to expect that the criticisms of *L'Art* would be influenced by the favor of giving it illustrations is to assume a principle which, if maintained, would destroy the independence and the value of criticism. Other writers have rallied to the defence of an impartial criticism uninfluenced by the favors of persons who may be criticised. All this is right enough, and it does the public no harm to have it set before them. It is a good reminder to Americans who favor a "genial criticism" that means only newspaper commendation, and to American artists, who are accustomed to receive all dispraise as personal affront. But the real question in Mr. Vedder's case is not whether giving his works for illustration should bind *L'Art* to praise them, or should influence their criticism of them, but whether the editor played the trick of which he is accused by Mr. Vedder, that is, obtained from him, by a request which properly carried an implication of approval, a permission to copy, that but for this implication would have been refused. As a matter of custom, we suppose that an artist whose works are demanded for illustration takes it for granted that they are wanted because they are approved, and that it is not the habit of journals to criticise freely those which they solicit. It might be assumed that Mr. Vedder would be familiar enough with *L'Art* to know what its habit was in this respect; but it is pretty clear that he did not expect any such disciplining as he received.

The case involves questions which are of interest to illustrated journals and their readers. There are, in fact, two theories on which those that concern themselves with art may be illustrated. One is that they shall give only illustrations which are examples of excellence; the other, that they shall simply record the actual movements of art. In the same way, in their text they may be either purely didactic or purely historical. Both schemes are in their way useful: the first is the more ambitious, and when well carried out the more honorable, but it is the more difficult and the more dangerous; the second is sometimes the only one that is practicable. As a matter of fact, few confine themselves absolutely to either theory. We may assume that all worthy journals try to make their illustrations as good as their schemes will allow; while there are not a great many which altogether refuse to illustrate works of especial importance that they may not consider exemplary. It is very desirable, of course, to avoid confounding the two elements, — the didactic and the historical, — and that a journal should not be taken to be holding up examples when it is only recording facts. In this, editors are exposed to misunderstanding from hasty readers, as writers of fiction and dramatists are liable to be held responsible for the sentiments expressed by all their characters. Against this danger their only security would be in the liberty of criticism which Mr. Vedder resents.

Here we will make an opportunity to put in a word for ourselves. We have been often asked why we have not refused to illustrate inferior designs, of which a good many will be found depicted in our pages. We have not found it practicable to confine ourselves to those which we consider exemplary; nor have we ever been quite persuaded that it is desirable to exclude all record of the average progress which a comparatively new art is making in a country where art is taking shape as fast as it is in ours. At the same time we should be extremely sorry if our readers were to assume, as we think is hardly possible, that everything that we illustrate has our approval. It has been more than once suggested to us to criticise the designs which we publish; but to do this, except in cases such as that of Mr. Story's design, just published, where there is special reason for criticism, or of the designs offered to us in our competitions, would be to add an extraordinary burden to the labors of our paper without sufficient warrant, — to say nothing of the contingency, shadowed in Mr. Vedder's case, that if we spoke our mind fully we might find ourselves without many designs to criticise. Nevertheless, it is much to be desired that artistic periodicals should be understood to be free to criticise their own contributions if there is occasion. The only reasonable alternative is an utter abstinence from comment, for no journal which respects itself would accept a license to praise, but not to blame. There is no good reason why an artist who gives a periodical an illustration of his work should be more exempt from criticism than the author who sends a copy of his book. The prevalence of such a habit might do something to relieve artists of that thinness of skin which makes them too irritable to accept benefit from public discussion of their work, however sound. Some who, like Mr. Whistler, require the world to "receive their work in silence" would doubtless refuse to entrust it to the hands of journalists, but the majority and the public might reap some advantage.

A rather queer case has come into court in St. Louis, which involves the question of the binding force of a contract to pay an artist for an unexecuted work. Mr. James Thomas had given a commission to Miss Edmonia Lewis for a statue of "the Virgin Mary at the Cross," to be set over a grave. Miss Lewis had made and shown Mrs. Thomas a model in clay, which, as the newspapers have cleverly put it, "enthusiastically met her approval." Thereupon a contract was made: Miss Lewis was to execute the statue in Rome, and send it home, receiving for it two thousand dollars in four instalments, of which the last was to be paid when the statue, finished, was delivered in St. Louis. These instalments were paid, and the statue was delivered. It was not as acceptable, however, as the model, but was rejected by Mr. Thomas with the complaint that it was a "burlesque on art," and Miss Lewis has brought suit for the remainder of her price, supporting her claim by her deposition that the statue is an exact reproduction of the model, and the affidavit of an Italian sculptor, or carver perhaps, that it is perfectly and artistically executed. The reports of the case do not give a very definite notion of the artistic quality of the work, the principal points of the testimony being that one arm was a little shorter than the other, and in general, as the report in the St. Louis *Post* records it, with a pleasant simplicity, that the work was "not substantial, or even artistically executed." Miss Lewis's position as a sculptor is somewhat peculiar, she being not only a woman, but the only sculptor of colored race who has attracted notice. She has not obtained distinction, we believe; which, however, is no more than can be said of some of her sister sculptors who have been honored with important commissions, even by the nation. The case is still under advisement, but we should suppose that a person who gave such a commission to an artist for a work of art would be held to his contract, however little he liked it, unless he could show either

an unwarranted variation from the accepted model, or a conspicuous incapability to execute the work, which he had no reason to expect, and of which the model gave no indication.

The advantages in the way of public patronage that are allowed to those French architects who have been trained in the Government School of the Fine Arts has always been a stumbling-block to their less favored brothers outside. How far it may have been the result of a *parti pris*, and how far of natural selection, we cannot say; but almost all the important architectural work of the government has been in the hands of the graduates of the school, and there are comparatively few others, like M. Viollet-le-Duc and M. Lassus, we believe, who without its aid have won important positions in the public service, or even great distinction. There are a great many appointments under government open to the architects in France, such as do not exist with us, which are naturally the desired emoluments of the profession, — the positions of directors and curators of buildings, departmental, municipal, and diocesan architects, inspectors and sub-inspectors. Lately the Minister of Fine Arts has brought forward a measure which would consolidate the architectural service with more distinct discrimination in favor of the school, by giving positions *ex officio* to all pupils who, having taken the great prize, have passed their term at the academy in Rome; and to exempt all who have won their diplomas from the competitive examinations which are required of other aspirants for appointment. This proposition has been opposed as reactionary and undemocratic. The council of the *Société Nationale des Architectes de France*, which, in opposition to the *Société Centrale*, is composed mainly or altogether of architects not of the school, has sent to the minister a strong protest against his measure, declaring it to be "a retrograde innovation in a day of free competitions," and more than intimating that the course of instruction at the *École des Beaux-Arts*, "although uncompromising in the matter of art, is notoriously insufficient as far as concerns architectural practice."

The Memorial for the establishment of an Industrial Bureau presented to Congress by Senator Davis, of Illinois, while it proposes many useful things, shows in a curious way the fingermarks of the advanced labor-reformer. It proposes the collection of careful statistics of labor employed in agriculture, mining, manufacturing, transportation, and building; showing production, consumption, the numbers of laborers employed or unemployed, with special inquiry into the employment and wages of persons younger than sixteen years; and requires that an account of the work of the Bureau shall be rendered in semi-annual reports and frequent publications, — all of which is desirable and useful. As a preliminary step it requests the appointment of a special commission which shall set to work at once to find out how far machinery has as yet superseded manual labor, — an innocent and interesting inquiry, perhaps a useful one, — and to see what legislation is required (so we find it reported) "to so regulate the use of muscle and machinery that a demand shall be created for the employment of the muscle now idle," and that there shall be machinery enough to keep busy, at living rates of wages, every man or woman in the land who will work. This is in the highest vein of patent philanthropy, and only needs a compensating attachment for so regulating appetite and temperature that nobody need be hungry or cold unless he chooses, to produce a perfect automatic generator of industrial happiness. If anything is more surprising than the sober presentation of so futile a scheme, it is the inconsiderateness with which men of influence and known intelligence are found to append their names to it.

It is reported that the proposition for a revised system of national surveys is slowly making its way through the Congressional Committee that has it in charge, and is likely to be returned to Congress substantially in the shape recommended by the report of the committee of the National Academy of Sciences, which we printed in our issue of December 28, 1878. There is, however, much opposition to the transfer of the work, which is now performed by several departments, to the sole care of the Interior Department, an opposition which is probably not diminished by the present want of *entente cordiale* between that and the War Department. Apart from the administrative question, it is difficult to see how any one who considers the subject can help feeling the great importance of the consolidation of the surveys under one management, whichever that may be, and the thorough prosecution of them by the general government under a uniform scheme. The difference in quality between the random work of local surveys and the government work may be seen by comparing the ordinary county maps of the older States with the sheets of the coast survey, or the survey of the Fortieth Parallel. The superb atlas of Colorado lately published under Dr. Hayden, geologist in charge of the latter survey, shows the advantages that may accrue to that part of our territory which has not yet passed out of control of the general government. That the people of Colorado are grateful for the benefit is shown by the late resolution of thanks offered to Dr. Hayden and his assistants by the legislature of the State. Professor Jules Marcou, the French geologist and friend of Agassiz, known here for his residence in this country and his participation in our surveys of the Rocky Mountains region twenty years ago, has written a letter against the proposition of the committee of the National Academy, urging the transfer of all the surveys to the War Department, with the abolition of the Coast Survey. But since we have, what most countries have not, an independent service disciplined to do topographical work with unsurpassed accuracy, with a well-established system and well-ordered appliances of their own, while our small force of admirably trained army officers, not specially habituated to this work, has always enough to do without it, we presume that Congress will think twice before making such a transfer.

In a late letter from the Rome correspondent of the Boston *Daily Advertiser* we find an account of some frescoes believed to be by Giotto, which have been very curiously preserved in the old church of San Sisto Vecchio at Rome. The church stands opposite the Baths of Caracalla. It was rebuilt in the thirteenth century by Innocent III., was altered in the eighteenth, a new church, to all intents and purposes, being built inside the old, and its original mural paintings had long been forgotten. Lately a Roman painter and archæologist, Signor Scifoni, who had in some way come upon an old tradition that Giotto had once painted the church, was moved to search for what remains of his work might be discovered. He found that in rebuilding the church a hundred and fifty years ago a new apse wall had been built inside of and concentric with the old, leaving an annular space of about a yard wide between them, partially occupied by a stairway which led to the campanile. Careful examination of the outer wall in this space showed traces of old painting, and when the wall was carefully scraped, remains of several compositions were made out, one of them quite large and important. The pictures had suffered greatly, from dampness and the crumbling of the plaster, but many figures and heads could be made out, among them a figure of St. Paul, in the head of which it is thought that the work of Giotto can be clearly recognized. In their present position these frescoes cannot be studied to advantage, and they are in a space so narrow that there is hardly possibility of detaching them from the wall securely. These difficulties, however, will not much disturb the Romans, who are singularly indifferent to their mediæval relics.

The same correspondent tells us of the great injury that has been done this last year to Raphael's famous Farnesina frescoes. In carrying out the works which have been undertaken for restraining the inundations of the Tiber, the embankment and groves which protected the garden in which the Farnesina palace stands were cut away, and the grounds so carelessly exposed that this autumn's flood filled the cellars of the palace, while the dampness has so affected the walls that the plaster is cracking badly, and the frescoes have been much injured. The ceiling of the hall in which are the paintings of Psyche has suffered greatly, it is said, and it is likely that the frescoes must be removed to save them from destruction.

We are reminded by a note from a correspondent, which comes later than we wish it did, that by a slip of the editorial pen a paragraph in our summary of November 16, on the Indiana State Capitol, was referred to the Illinois Capitol. To those of our readers who have followed the fortunes of either building the mistake must have been obvious; but we regret the carelessness or preoccupation that prevented our discovering it in season, and that may possibly have led us to a like mistake in other places. No work has been done for two or three years on the Illinois building, which is well on toward completion.

"ART IN THE HOUSE."

WE have been so accustomed to expositions of the history, theory, and practice of household decoration from the English point of view, and to a notable series of reforms and revivals in art, based upon English precedent, that a work upon the same subject, and treated with the same conscientious spirit, from the further side of Europe, must come to us at least with the charm of novelty. The enterprise of Messrs. L. Prang & Co., in publishing a translation of Dr. von Falke's work, under the title of "Art in the House,"[1] edited by Mr. C. C. Perkins, of Boston, would therefore be a matter of especial interest to all lovers of those forms of art which

"Can enter in at lowly doors,"

even if their undertaking had resulted in a far less sumptuous book than that which lies before us. The ineradicable insular prejudice (or, shall we say, patriotism?) of English writers which concentrates their views upon the phenomenal developments of art in the history of their own island, leaving the great continental facts which lie at the door of all artistic expression in a sort of misty background, has not been without its advantages; doubtless it has given them the strength of convictions, and, in narrowing the scope of their studies, has enabled them the more thoroughly to comprehend and develop the spirit of the styles to which they have chosen to confine themselves. Thus, English architects seem to have already legitimately evolved from the so-called Queen Anne style all its capacities of expression, and to have pressed its possibilities far beyond the dreams of the English builders of the seventeenth century. The obvious danger of this concentration of force lies in its inevitable tendency to antiquarianism. Even the work of the greatest master of this revival, Mr. Norman Shaw, has more of archæology than of architecture in it. However curious and ingenious his developments of the style may be, they have not in them the element of life. The energy for a long career, as M. Viollet-le-Duc has observed, exists only in pure types.

As it is an undoubted fact that we in this country draw a large part of our architectural inspiration from England, and faithfully follow in our practice the various phases of contemporary art in the mother country, any book which, like this of the accomplished Austrian scholar, recalls us to the contemplation of the Italian art of the sixteenth century as the fountain-head of the Renaissance, and subordinates all the subsequent foreign developments of the Renaissance to its purest intellectual achievements in the palaces of Venice and Rome, — any book which performs this service should be doubly welcome. The English halls of the Tudor and Stuart styles, Crewe, Speke, Haddon, and the rest of them, picturesque but corrupted types, from which we have been endeavoring in vain to draw inspiration for an architecture fit for the nineteenth century, seem poor and illiterate indeed when we turn to the imaginative and intellectual work of Raphael and his pupils in the decorating of the Italian palaces.

The best service which Dr. von Falke's book renders to us is its elegant presentation of the primary claims of this Italian art as a starting point for studies of household decoration. In the historical part of the volume, which is enriched with copious and learned notes by the American editor, the story of the development of mediæval forms of domestic art is not neglected. We are furnished with a summary statement of this phase of art, not so extensive or exact perhaps as we have received from other sources, but sufficient to enable it to take its due position in the history; but the chapters on the Renaissance of Italy, France, Germany, and England in the sixteenth and the two following centuries leave little to be desired. As regards the German phases in especial the work is fresh and full, as might have been expected, while those of Louis XIV. and Louis XVI. in France are expounded with appreciative minuteness. We miss, however, a due recognition of the style which prevailed in the time of Louis XV., which was an exact reflection of the social characteristics of the period and full of traits of individuality.

It is impossible to survey the European developments of the Renaissance of Italy, especially in its application to interiors, without renewed astonishment at its unbounded fecundity and its capacity for various expressions. It followed the French kings when they returned from their Italian wars with the spoils of conquest, but straightway it became French; the decorations of Fontainebleau, Chambord, and Madrid, although made up with the same pilasters, entablatures, arches, and panellings as those of the villa Madama, the Pitti palace, and the Vatican, took upon themselves a new character and received an impress of spirit almost indefinable in its earlier manifestations, but sufficient to show that the style was adapting itself to new conditions of life and manners. The spirit of every successive reign in France, as we well know, is made evident to the senses in the characteristics of the industrial arts; and furniture of all sorts, cabinets, stuffs, ceilings, screens, and decorations in color, are thus not only what they seem to be, but also, when viewed aright, the symbols of history. This consideration, of course, gives to the study a dignity undreamt of by the writer in the *Edinburgh Review* some forty years ago, who, in noticing Hope's work on furniture, took vigorous exception to it on the ground that such subjects are unworthy the attention of a free-born English gentleman. If a comparison of the furniture of the Consulate and Empire with that of Louis XIV. presents to us at a glance the strong contrasts in the spirit of the two epochs, and in their manners and politics, the modifications which the Renaissance forms underwent in the *salons* of Belgium and the German states, which would fain be French, but which, nevertheless, were ineradicably Teutonic, are no less significant. How in the houses of the patrician families of Augsburg, in Flemish interiors, and in the dwellings of the rich burghers of Hamburg, the generic forms of the Italian Renaissance again submitted to change, how the Baroque style introduced by Alessandro Vittoria of Trent in the library of St. Marks, and the French Rococo of the eighteenth century, assumed new extravagances and characteristic eccentricities, when quoted by the German decorators and cabinet-makers, — these details are well set forth in the book before us; it is interesting and instructive to compare them with the familiar manifestations of the John Thorpes, the Grinling Gibbonses, and the Inigo Joneses of England, when they, too, tried to be Italian but remained English in spite of themselves. A director of the Austrian Museum of Art and Industry in Vienna may well be in a position, if not fully to appreciate the Renaissance according to Queen Elizabeth or Queen Anne, certainly to understand the spirit of that according to the French and German states. Dr. von Falke, therefore, for English and American readers, has presented a contribution of knowledge in this respect not so well covered by any other accessible historical work.

In the half of this book devoted to the theory and practice of domestic art the tone of our author is rather that of an academical professor than of a practitioner. The commonplace facts of decoration and taste are set forth and illustrated with great circumstance and learning, but we fail to discover any new principles and we miss many which a book of this character should not fail to enforce with persistence and argument. The professional reader will perhaps not be pleased to see that, in the outset, Dr. von Falke discourages the employment of architects on domestic interiors, on the ground that their aim would be to obtain harmony by carrying out in the smaller details of furnishing and decoration the same historical style which they may have chosen for their exteriors, thus depriving household life of a certain part of that eclectic individuality which should rather be encouraged than otherwise, and giving to it a certain monumental or pedantic air, which is inconsistent with the conditions of modern society. He recognizes the fact that with the completion of the house as a structure the architect's work usually ends, and that of the decorator and upholsterer begins, and that the result in common practice is vulgarity, or, if not vulgarity, incompleteness, in the sense that the manifold opportunities for artistic expression which are offered in the furnishing and decoration of a house are not properly availed of. He then proceeds to maintain that the necessary harmony can be obtained without regard to unity of historical style, that harmony is obtained, not by avoidance of anachronisms in the forms of tables, chairs, and cabinets, but by adjustment and color. All the instructions in this part of the book are based upon the assumption that he is addressing himself, not to professional men, but to the public. But in fact no layman can read through these hints of practice and these philosophical theories of harmony — and it is very interesting reading to any intelligent person — without an increased appreciation of the difficulty and complication of the subject, and an increased respect for the services of the educated specialist who can advise and work for him with the strength of convictions based, not upon prejudice but upon knowledge, not upon fashion but upon high principles of taste, capable of explanation and defence.

Our author considers in separate chapters the treatment of floor, wall, and ceiling. These chapters abound with sound knowledge and good advice, though they are far from covering the whole ground in any case, and do not rise, in either the text or the notes, above the commonplaces that are the public property of writers on decorative art, betraying the insufficient equipment of the amateur, learned in theory but weak in practice: thus, as regards the finishing of walls in a common room, among all his suggestions and his references to precedent and his illustrations, so beautiful and profuse, we find no allusion to the fundamental fact that the treatment with color must be based upon a proportional division of the wall-surface, that equal divisions by vertical lines of separation are fatal to effect, except in corridors, galleries, and public places, and that equal divisions by horizontal lines of demarcation are fatal anywhere. He does not recognize that, among the simpler and most used methods of obtaining artistic effects in wall-surfaces, the most important are these proportional adjustments of spaces so as to harmonize with the occupation, the aspect, the size, and the surroundings of the room, and the treatment of these spaces with arrangements of tones, colors, or textures. In every department we find omissions as striking as these, although in the same departments the chapters are in other respects sufficiently full and suggestive. We have not space or desire to enumerate these deficiencies nor to quote the very few passages which are absolutely misleading; but it is important to note that the whole scheme of the practical part of the work, namely, the treatment of walls, floors, and ceilings in separate chapters, is unscientific and dangerous from an artistic point of view. Obviously, all effects of domestic interiors depend upon a prevailing harmony and a mutual adjustment among walls, floors, and ceilings

[1] *Art in the House.* Historical, Critical and Æsthetical Studies on the Decoration and Finishing of the Dwelling. By Jacob von Falke, vice-director of the Austrian Museum of Art and Industry at Vienna. Authorized American, translated from the third German edition. Edited with notes by Charles C. Perkins, M. A. Illustrated. Boston: L. Prang & Co. 1879.

in each room. The connection between these several parts is absolutely indissoluble. A chapter on ceiling which does not constantly refer to walls, or a chapter on walls which does not treat of ceilings and floors at the same time, to show their condition of interdependence, if it does not absolutely mislead, is suggestive of error and confusion. It would seem, therefore, that the proper divisions of such a treatise as this should be with respect to the *occupation* or *use*, and not with respect to the *parts* of rooms, as Parlor, Dining-Room, Library, Chamber, etc., not Walls, Ceiling, Floors, and Draperies. Moreover, as in every domestic interior, rooms are arranged in suites, and as the Hall introduces us to the Parlor, the Parlor to the Library, the Library to the Dining-Room, etc., and as these must have different aspects and different treatment, it is improper to consider any one of these apartments without reference to its neighbors. Each may be perfect in itself, but they may all be mutually destructive, if their condition *en suite* has not been properly considered, and if the effect of one has not been enhanced or justified by the effect of the adjoining room. The book, in fact, suffers from the fault which affects the whole non-professional literature of decorative art, that of substituting the doctrinaire or the archæological view for that of the artist, and hence, though full of interest on account of its material and illustrations, gives the impression of a certain lack of artistic discrimination, and must, in fairness, be set down as unlikely to be of much service by its suggestions. We trust that these oversights may be corrected in a subsequent edition of this elegant volume, and that a mind as skilled in the practice of decoration as that of Mr. Perkins, the present editor, is skilled in the history of art may be employed to illustrate and complete this part of the book with notes as copious as those which increase the value of the historical part.

The work closes with some extended observations upon table linen, table wear, and embroidery, — observations which, in the present sensitive condition of the public mind, will not fail to obtain for themselves careful readers.

The illustrations are very apt to the text, very abundant, and very well chosen. In fact, one may turn these pages without reading a word of the essay, and arise with a better knowledge of the theory of decoration and a greater respect for its immense resources. It must be confessed, however, that they are somewhat disappointing, both from the air of heterogeneousness that necessarily belongs to drawings by a great variety of hands and methods, and from the necessary imperfections of so many reproductions by photographic processes. Some of the chromo-lithographing is very good indeed, notably that of an Italian Interior in the sixteenth century. The albertotypes are not much improved by the grounds of various tints on which they are printed, with the purpose, we fear, of disguising their want of clearness. The typographic etchings, too, naturally lack the character of electrotypes from the blocks ; some of those from Viollet-le-Duc doing especial dishonor to their originals. The editor has given his reader no means of discriminating between those which were inserted by the authors and his own additions. These illustrations comprise chromo-lithographs, typographical etchings, albertotypes, and wood-cuts, most of the last apparently original ; but the rest are mainly reproduced in a liberal and appreciative spirit from the works of Niccolini and Mazois, Viollet-le-Duc, Grüner, Semper, Jacquemart, Lepautre, Shaw, Nash, Lacroix, and other leading authorities more or less inaccessible to the general reader. Of the translation it is but fair to say that it has the conspicuous merit of reading like good original English.

The book, however, was undoubtedly intended rather for popular than for professional reading. If it were completed in respect to its practical parts by proper annotations and a few additional illustrations of the application of theory to common practice, suited to our time and place, it would be the best of its kind. But it has a sort of drawing-room air which suggests the idea of book-making, — that book of the *Bracht-ausgabe* which, while it is attractive to the seeker after Christmas gifts, is rather repelling to the serious reader. This is a too common fault with works on this subject. Books which are swollen by coarse type and thick paper till they are too bulky and heavy for comfortable reading, and need a clamp to hold their pages down, may appeal to the dilettante, but do not commend themselves to the student. Nevertheless the student who reads it will find much that is of value in it, and the non-professional reader will prize it as a compendium of very interesting information excellently arranged and admirably illustrated.

PLANS OF DORIC TEMPLES.

This little atlas[1] gives, what we believe has never been given before, a general conspectus of the forms of the Greek Doric temple by showing side by side the plans of all the principal examples whose plans have been made out, drawn to a uniform scale. The trustworthiness of the plates is that of their authorities, who are the chief in their respective subjects, — Blouet, Hittorf, Stuart and Revett, and those who have continued their labors, Cockerell, Penrose, Michaelis ; that the latest have been consulted, we see by the plans of the two temples at Olympia taken from the records of the German Government explorations within the last three years

[1] *Plans of Twenty seven Doric Temples* taken from the Best Authorities, and drawn in a Uniform Scale. By Charles H. Burr, student in the Lawrence Scientific School, Harvard University. Cambridge, 1878.

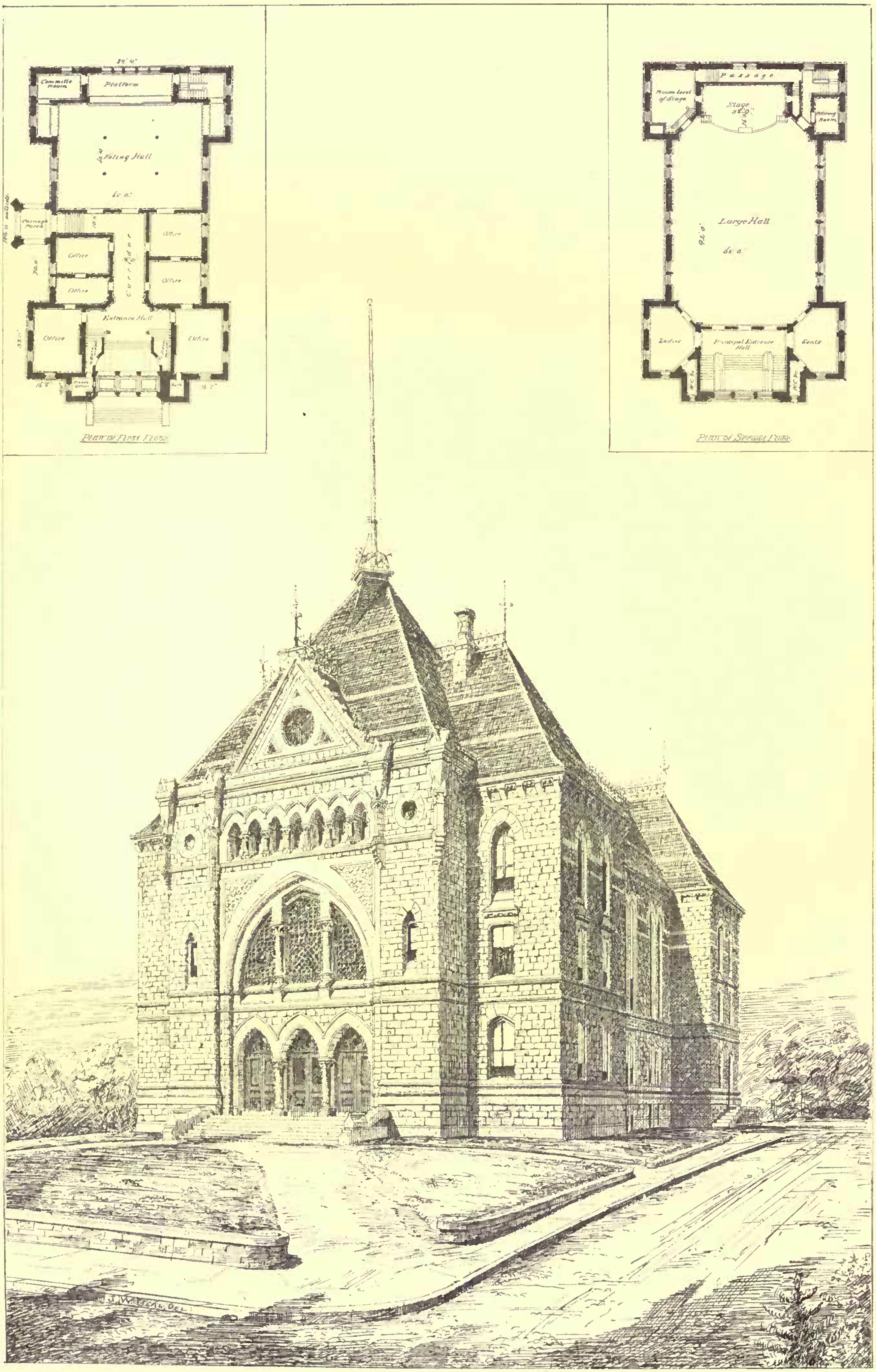
No text is given, except the table of contents with the authority for each plate. Nothing is said of the system on which the plates are arranged ; but they appear to have been placed with an idea of approximate chronological order, or at least of the order of development in point of style. It would have been convenient for reference if the dates had been added to the table of contents, as nearly as they are made out. The plates are sufficiently well drawn, and reproduced in heliotype. One is puzzled to guess what was the reason of the awkward and arbitrary scale adopted (100 feet to six inches), a scale which no architect would dream of using, and in which nobody thinks, but which just misses of being the accustomed and convenient one of sixteen feet to the inch. The work must have cost its author no little pains, for which we may hope he will find his reward. It ought to be valuable to students of Greek architecture, showing them conspicuously, among other things, what students are very apt not to realize, the variety in size and arrangement of the Greek temples, from the little temples *in antis* of Theseus at Rhamnus or of Artemis at Eleusis to the huge structures of Selinus and Agrigentum.

HADRIAN'S VILLA.

No palace ever erected has approached, in real vastness and sumptuousness, the Villa of Hadrian, and in the light or the shadow of it the world reads a large chapter of Roman history. The ground covered was many acres square, and within its circuit are now discovered nothing except enormous subterranean labyrinths, — which the modern archæologists have, with some purpose, resolved to explore, — prodigious scattered blocks, and here and there outlines of buried walls. These, it may be remarked, fit in well with the excavated outlines on the Esquiline and Palatine hills, though belonging, in many instances, obviously to a later date. The point of interest, indeed, was to determine whether the Emperor Hadrian built from an idea of his own, or whether he adopted a tradition, inherited from his predecessors. Unfortunately, the mercenary Italian archæologists have hitherto made it a mine of spurious discoveries, but fortunately, on the other hand, many world-known monuments have been recovered from within its precincts, as many others are waiting to be disinterred, — the red antique Faun, the celebrated Centaurs in gray marble, the Harpocrates of the Capitol, the Muses and the Flora of the Vatican, the Antinous bas-relief now in the Villa Albani, and the famous mosaic of the Doves. With all this, until recently, the Villa of Hadrian has remained an enigma, with its mingled blocks of stone and masses of brick, aggravated by the audacious forgeries of Italian archæologists, who published by thousands copies of inscriptions discovered in the Hadrian Palace, but which never existed there. It is now, for the first time, that we have a faithful description of this marvellous edifice, as its broken ruins remain above ground, and as its more neglected — yet perhaps on that account more authentic — vestiges remain below.

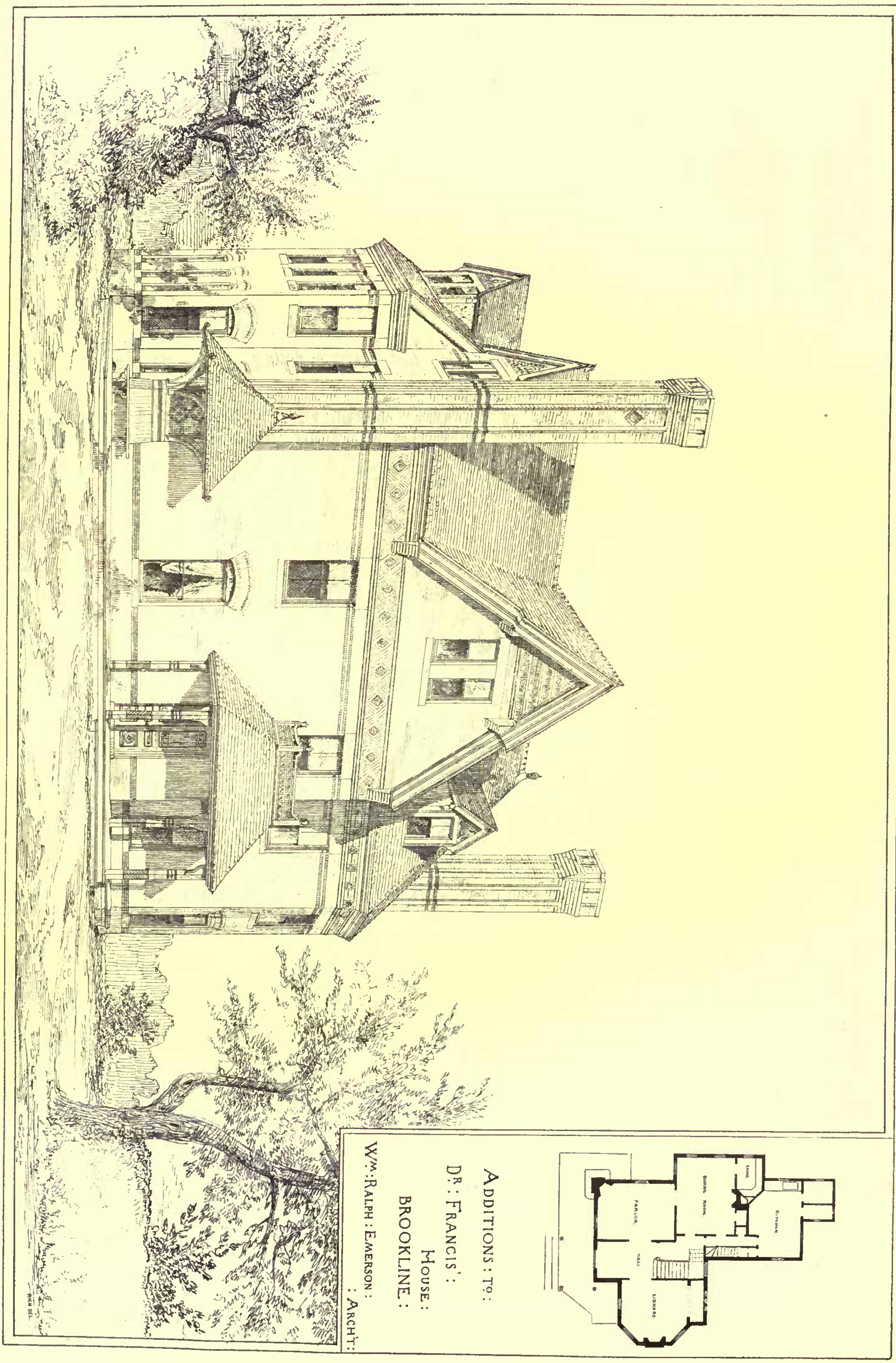
The Emperor Hadrian, be it always remembered, in connection with this work of a unique genius, so often described, and until just lately so little known, was by both birth and culture half an Italian and half a Greek, and when he contemplated rearing a palace on the Tiber, stood aloof equally from both. In his choice of a site he was, from a picturesque point of view, unhappy ; from another, far more important, his sagacity has never been questioned. He selected the healthiest spot upon which builder could build, on the breezy spurs of the Apennines, within reach of a western wind, protected by hills against the sirocco. The ground was of an uneven surface, and the architect caused it to be levelled, whether by hewing down protuberances in one direction or laying down masses of masonry in another, until a partly natural, partly artificial terrace of three miles in extent was obtained. Hence the vast subterranean spaces left for modern antiquarianism to explore. Among the subterranean devices were two arched passages of immense length, through which streams of living water were, it would seem, diverted from their original channels, and it is clear that his travelled mind was ambitious to preserve, not only the memory of his actual wanderings, but even more — for, after he had caused imitations to be produced of all the scenes ever visited by him on earth, he ordered an artist to idealize, as is evident from a series of vaults lately unearthed, the phenomena of the infernal regions. Such a palace and such a Cæsar may well have provoked the curiosity of all subsequent time, and especially so when the record is detected on an inscription, "that the curiosities of the entire world are to be admired in collection here!" An altogether new light is thus thrown upon the hitherto concealed by-ways among the foundations of Hadrian's Villa, with its cosmoramic reproductions, — of mountains in miniature, valleys such as might be painted on a magic-lantern transparency, and dwarfed reproductions of monuments. Yet Hadrian himself, as these latest revelations demonstrate more emphatically than ever, was a master-artist, inspired to a considerable extent by the Grecian genius, and always tormented by the idea that, in his palace, he would not really produce the effects and imitations he desired. It was a barbarous ambition, toned down by a cultured self-consciousness. Many a long-buried mimic Lyceum, Prytaneum, and Gymnasium has now been dug up, evidencing the extent to which his eccentric ambition rose.

But perhaps the most interesting of the new discoveries are those by which — the pedantic part of the vast subterranean ruin being left

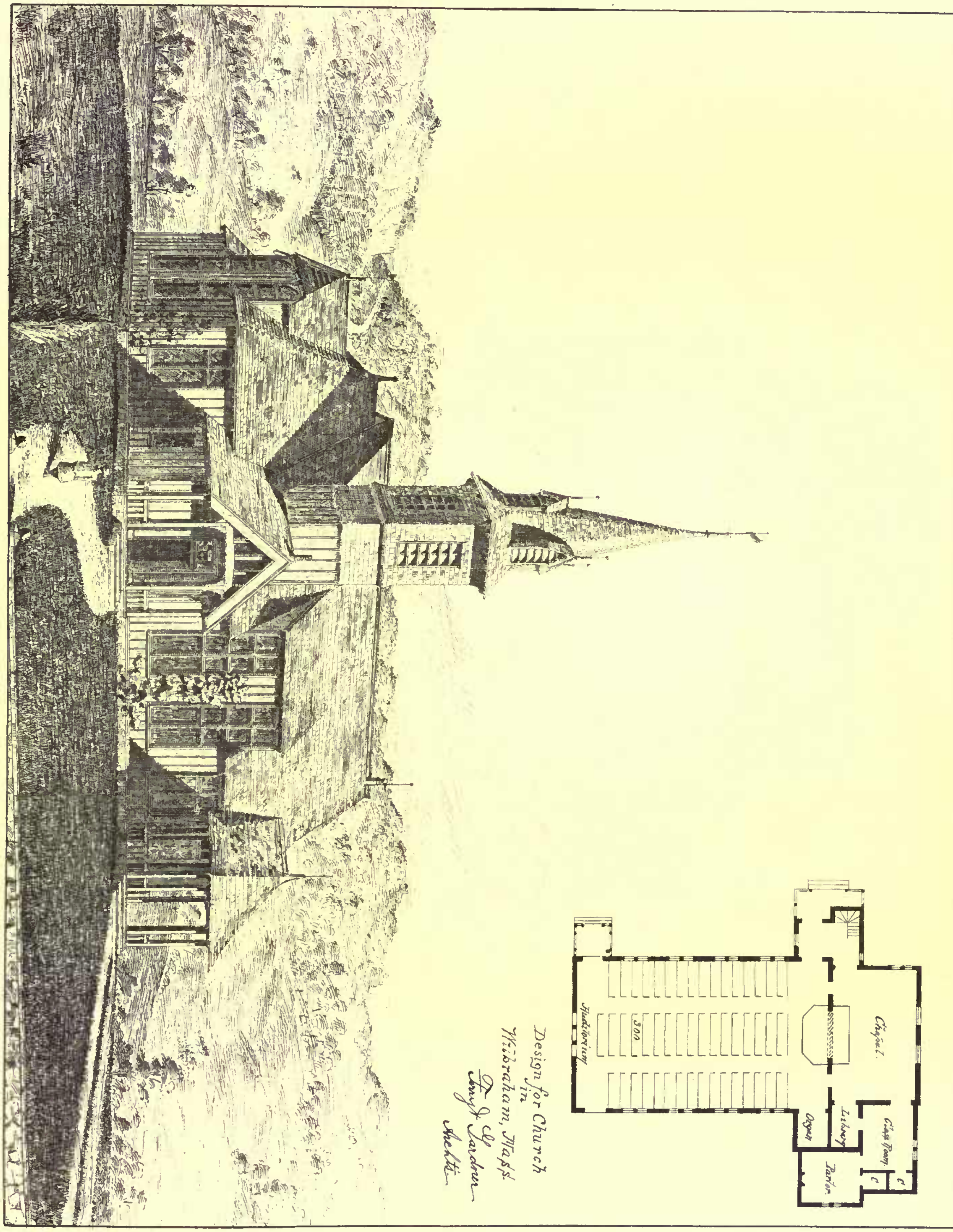


Town Hall, Brookline, Mass.
Mr. S. J. F. Thayer, Archt.

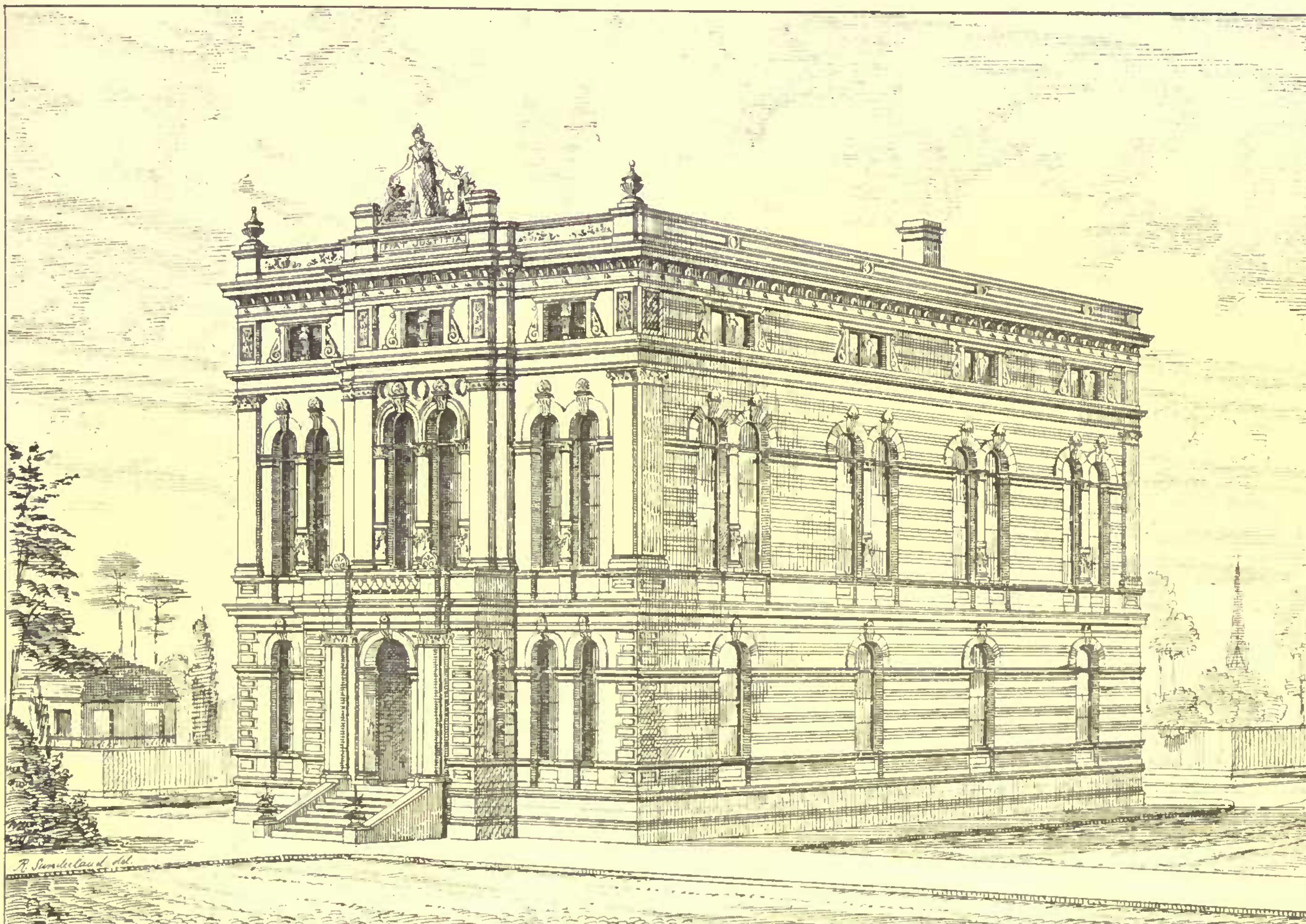
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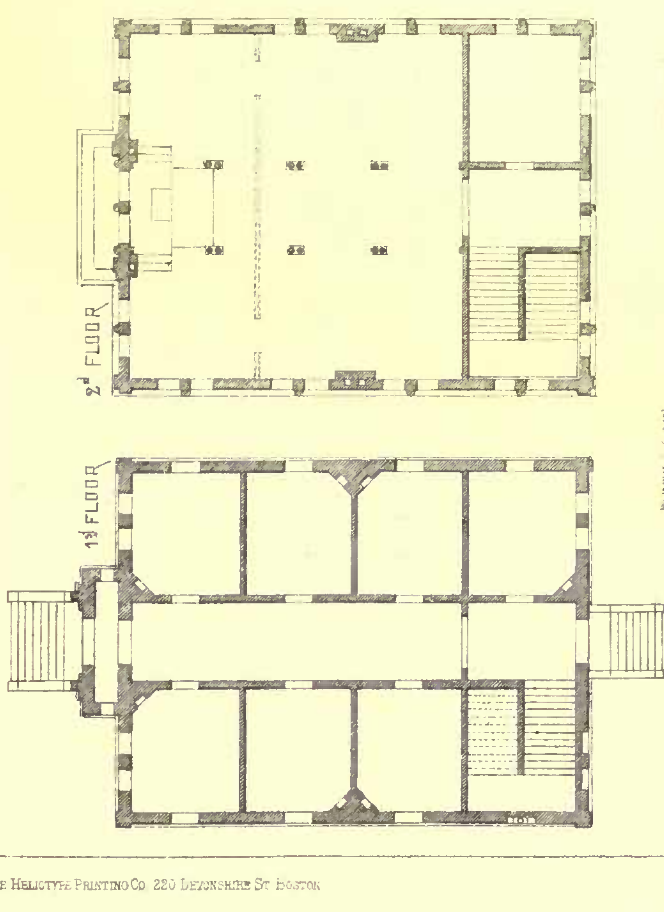
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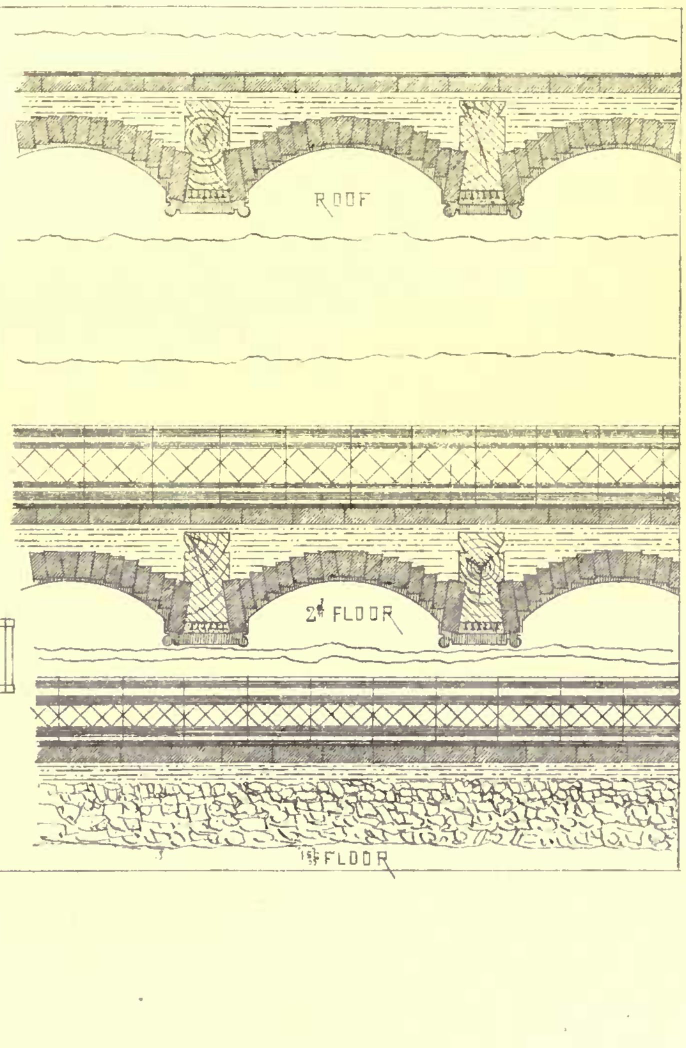


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COURT HOUSE FOR COLEMAN CO. TEX. GLENN & WAHRENBERGER. ARCHTS. AUSTIN. TEX.





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behind — the domesticity of antique Roman imperial life is reached. The state apartments were preserved; but the theory was that the family lived its private life above them, — an opinion which might apply to private and comparatively modern dwellings, but not to imperial or noble abodes. The doubt has been justified. Within the cryptic spaces of the palace — and this is a fact of extreme interest — have been traced the foundations and walls of sumptuously-ornamented chambers, hollowed in the tufa rock, or built up of bricks belonging to the most antique dates, for Italy, of that manufacture.

The private gardens and apartments are almost always reached by subterranean passages, though an opinion is implied that chambers somewhat equivalent to modern nurseries were situated on the highest floors. As has been noticed, however, with reference to the Palatine Hill, the Cæsars often separated their private from their official residences on the Imperial Mount; and that this custom survived in the days of the domestic Antonines.

It would be difficult to imagine, even as they are exhibited now, fresh to the light and air, after centuries of inhumation, a more brilliant "restoration," so to speak, — porticoes, peristyles, buildings of all sizes and shapes, domes of grand saloons, rounded arches, pedimental façades of temples, decorated towers, and trellised terraces spread over large flat roofs, — the whole Forum in one, so to speak, and yet possessing the cohesion and uniformity of a single structure inspired by a single mind. Even yet, however, notwithstanding all the illumination which has been kindled amid the remains of this incomparable edifice or *congeries* of edifices, to which the title has been given of Hadrian's Villa, it is difficult — impossible, perhaps — to assign a meaning to all these incessant varieties of chambers and corridors, enclosures and open spaces; still, some lines are distinctly traced, which may as safely be followed. Thus the great reception rooms — or such as, by their magnificence, appear to denote that purpose — were situated in long ranges on the eastern side, but were not attainable except through a series of architectural vistas, effectively contrived — an octagonal vestibule, one of those courts which the Romans called peristyles, of which many examples occur among these bewildering and beautiful groups, though none approaching in elegance of proportion or exquisiteness of work to that to which the name has been given, in a modern taste altogether, of "The Golden Piazza." This, however, with its columns of Cipoline marble and Oriental granite, its pink-marble pavement and fragmentary pedestals of statues which have disappeared, is a discovery rather perfected than originated during the late researches. Opening from it the explorers have hit upon an immense hall, surmounted by a cupola, and terminated by an apsis of peculiar shape, with niches at the four corners, whence light was received from above, — an arrangement well known in the Belvedere of the Vatican, for the perfect exhibition of sculpture. Still, all these superb proportions and profuse embellishments suggested only the idea of halls dedicated to the purpose of imperial audiences, private life being left out of the light altogether. It now is evident that from these led long garden walks, over terraces, through passages partly under ground, to where the Roman patricians took their leisure; and from these again to libraries of Greek and Latin volumes — baths, lined with white marble, about a yard in depth and eighteen feet in circumference; small rivulets to relieve the bathers after their somewhat Turkish exercise, and bridges of marble leading from these to a central islet, not a vestige of which was visible among the modern fashionable relics, whereon stood — a circumstance notable — a square hall surmounted by a roof composed of "what architects in the present day call cloister-arches." Around this would seem to have opened alcoved niches, each containing a separate bath; but the whole overwhelmed by a confusion of mutilated marbles, — columns, capitals, plinths, and bas-reliefs, — Tritons, Nereids, and Amorinos, the last mounted, strangely enough, upon hippogriphs, and all these tending towards a gigantic hall now choked almost up to the ceiling with rubbish; yet, where French archæologists of the latest date feel sure that they have discovered not merely the remains of the Lyceum and the Prytaneum, but also those of the private Roman life and manners which have, during so many centuries, lain sepulchred beneath them. There is one section of these despoilments from the past to which has been allotted the designation of "The Hundred Chambers." It is no more, as these fresh reports and documents prove, than a misleading and romantic application of words. But the discoveries do lead up to the fact that there were, beneath these gold and purple palaces, barracks for soldiers and prisons for slaves, concealed from the common sight, one of the latter hewn in the rock, and yet having to be aided by a wall forty feet high and three hundred yards long; all within the precincts of Hadrian's Villa, which contained also a theatre, a race-course, a lake upon which boats, resembling the gondolas of modern Venice, were rowed, and besides twelve hundred chambers — more than those of the Vatican — dedicated to the fashions and simplicities of private life. — *Building News.*

THE ILLUSTRATIONS.

COURT-HOUSE FOR COLEMAN COUNTY, TEX. MESSRS. GLENN AND WAHRENBERGER, ARCHITECTS, AUSTIN, TEX.

THE dimensions of the court-house are about 52 × 67 feet, giving a court-room about 47 feet square. The front is to the east, from which direction the principal summer breezes come. The peculiarities of the floors and roof are what will probably most attract attention, and they are offered for the criticism of the profession. Within limited dimensions the problem of a fire-proof building is thought to be here solved — if the merits of white oak treated after Hayford's method of creosoting are understood by the architects. Its whole success depends upon that process accomplishing all that is claimed for it. Taking into consideration the spans of the girders proposed in the plans, the calculations assure safety under all circumstances. The roof girders over the court-room are supported by two rows of iron columns carrying iron girders on which the wooden ones rest. The height of the court-room is 25 feet. The difference between the expansion of the walls and these iron columns for a range of ninety degrees is not sufficient to produce cracks in the roof. The thickness of the walls is sufficient to safely withstand the thrust of the floor arches, to which is added this additional precaution: the concrete filling on the top of the arches at the walls has a four-inch horizontal bearing block in them. The distance between the girders is three feet. The clays and sandstones of the carboniferous formation of Texas are as abundant and excellent as in any state in the Union, and Coleman County is situated in the "carboniferous" and has an abundance of excellent lime and sandstone in the immediate vicinity of the building. Some of its clays are in deposits thirty feet thick, of the highest refractory powers and almost entirely free from impurities. Some of them possess a large amount of bituminous matter, which gives it a black color, but does not interfere with its manipulation and burns out in the kiln.

The following extracts from the specifications will explain other details of the construction of this building: —

FIRST FLOOR. The space included within the foundation walls is to be filled with coarse gravel, broken stone, or broken bricks, in courses of six inches; each course to be thoroughly rammed into a compact condition up to six inches of the floor-line. On this is to be placed concrete three inches thick, evenly trowelled, composed of lime, sand, and broken stone in such relative proportions as will be designated by the architects. On this is to be laid a cover of hard-burned brick with a thin clear cement bed, and the joints grouted thoroughly with clear cement. The cement to be standard Rosendale. On this is to be laid in clear cement encaustic tiles of pattern, etc., as shown in detail drawing No. 9.

SECOND FLOOR. The girders, wood; white oak, clear and free from wind or bend, 7 × 14 inches, creosoted by Hayford's process; scored lengthwise as shown in drawing No. 4.

The bearings of the girders on the walls to be of vitrified brick laid in cement as shown in drawing No. 4. The arches to be of vitrified brick grouted with clear cement, and arranged as shown in drawing No. 4. Over the arches and for a depth sufficient to cover the girders one inch on top, a concrete of cement, sand, and broken stone will be placed and well trowelled. After giving ten days for this concrete to set, a brick floor laid in clear cement and joints grouted with clear cement will be laid, on which the floor of encaustic tiles laid in clear cement shall be placed. Details of pattern, etc., of tiles as shown in drawing No. 9.

ROOF. Same construction as second floor, omitting the tiles; in place of which and after the brick cover has thoroughly dried, a coating of asphaltum $\frac{1}{4}$ inch thick is to be laid, on both the top of roof and up the sides and on top of the parapet walls; on which asphaltum, kiln-dried, coarse, sharp sand will be spread and well trowelled in as long as the asphaltum will retain it. The condition of the asphaltum must be such as not to run at 150° Fahr.

GIRDERS. The cross-section shows the springing bricks of the arches projecting three inches below the lower face of the girders. The space included between the face of the girders and these brick projections is treated as follows. In every square inch of this exposed face of the girders a wrought clout nail of the following dimensions, $2\frac{1}{2}$ inches long, $\frac{1}{8}$ inch thick at junction with head, head to average $\frac{1}{4}$ inch square or its equivalent, will be driven into the girder, 2 inches and $1\frac{3}{4}$ inches alternately, leaving the heads projecting $\frac{1}{2}$ inch and $\frac{3}{4}$ inch. A composition of one part of fire-clay and three parts of ground fire-brick is to be thoroughly mixed with cistern water to a plastic state, and pressed and trowelled in and flush with the lower line of the projecting springing bricks. This filling is to be undisturbed until thoroughly dry. If, after drying, cracks should appear in it anywhere, they must be carefully cut out and filled; and this operation repeated until it is as solid as the character of the material permits. The ceilings are at this stage ready for the usual lime plastering and hard finish as shown in drawing No. 4.

BASES. Stairs of brick laid in lime mortar with slate risers and treads. All as shown in cross-sections and details in drawing No. 5.

CHARACTER OF MATERIALS. Where not otherwise specified, as follows: —

Brick. Hard burned from the middle of the kiln, and free from warps and defects. None but whole brick will be used in the building except where clipping is necessary.

Sand. Clean, sharp sand free from lime.

Lime. Fresh burned from hard stone, three hundred pounds to barrel.

Stone. Brown sandstone from the "carboniferous."

Cement. Standard Rosendale or its equivalent.

TOWN HALL AT BROOKLINE, MASS. MR. S J. F. THAYER, ARCHITECT, BOSTON.

This building was commenced in the autumn of 1870 and completed in the spring of 1872. The base of the building, its string courses, voussoirs, cornices, etc., are of Blue Hill, Me., granite, of a light gray tint, the shafts of the columns are of polished granite, and the capitals of white and gray marble. The walls are faced with a rose colored granite from Dedham, Mass. The interior is well finished in hard woods, the walls of the entrance halls, corridors, and large hall are treated in color, and the principal windows are of stained glass. The cost of the entire work was $167,000.

DESIGN FOR A CHURCH AT WILBRAHAM, MASS. MESSRS. FERRY AND GARDNER. ARCHITECTS SPRINGFIELD, MASS.

The contractor's estimate for the building of this little church was $6,000.

ADDITION TO THE HOUSE OF DR. FRANCIS, BROOKLINE, MASS. MR. W. R. EMERSON, ARCHITECT, BOSTON.

PAPER BRICKS. — A manufactory of paper bricks has been opened somewhere in Wisconsin. The bricks are said to be exceedingly durable and moisture-proof. They are also larger than those made of clay.

CORRESPONDENCE.

THE ART-CLUB EXHIBITION. — THE EXHIBITION OF ETCHINGS AT THE MUSEUM OF FINE ARTS.

Boston, February, 1879.

So much foolish exasperation has been aroused concerning the acceptance and rejection of pictures sent to the Art Club for the exhibition that a considerable increase of interest (or it may be only of curiosity) has been visible since the exhibition has been in progress.

The collection of pictures seems on the whole neither better nor worse than most of those which have lately preceded it. One is surprised as regularly as these exhibitions are opened that so many intelligent and careful artists as can be reckoned up in Boston do not suffice to make a better show. The artists are intelligent and practised; they know the methods of their art; they do not want for models, for the best examples to study, or for the stimulus of competition; yet the results are, it must be confessed, far from satisfactory, and cannot be said to improve much from year to year. Plenty of respectable work there is, but very little which can be called masterly. For this discouraging fact there are perhaps more reasons than appear on the surface, but I think it has much to do with the absence of anything like frank and searching criticism, either among the painters themselves (which would be the best sort), or on the part of outside critics, to offset the extravagant praise which is so generally bestowed on work which is really little better than commonplace, and the ready complacency with which the artist accepts the estimate of his worshipping friends. We may be sure that so long as flattery and adulation are the only criticism which is welcome to the artists, we shall never see the glories of the French *salon* repeated in our modest galleries.

The most noteworthy fact about the present exhibition is the almost entire absence of foreign pictures. The place of honor is justly given to the great picture of Courbet, — a picture which disappoints one at first sight as seeming to offer in its subject no reason why it should have been painted on such a scale. A quarter of the canvas would have sufficed to render the scene with perfect adequacy, and with greater comfort to the beholder. But the picture shows a wonderful mastery over the difficulties of its subject, which are none the less that this is so simple and common. A group of rather uninteresting village girls, stopping to gossip by a poor little brook which winds down a sloping pasture bounded by two blank walls, one dark, the other light, — that is the whole subject. There are no salient features of landscape, no splendors of color, no graces of form or sentiment, on the part of the figures, to give interest to the picture. All the interest is created by the force, knowledge, and reserve with which the painter has treated it, and the thoroughness of his work, which makes it an example for the followers of the modern "suggestive" method of painting to study with diligence and modesty.

Besides the Courbet there is no picture by any foreign artist of renown, except the Ziem, a noble Venetian view, with the strong glow which characterizes this charming painter, and which he knows so well how to keep within just bounds. I am forgetting No. 100, catalogued as a Turner, a view of the Bay of Naples, with the atmosphere of Birmingham. It would be interesting to know at what period of Turner's life he was capable of painting a picture which contains in a small compass nearly every fault of color which Mr. Ruskin has discovered in the landscapes of Claude, Poussin, or Salvator.

Of our native artists, several whom we have learned to look for at these exhibitions — Mr. Hunt, Mr. Fuller, Mr. Appleton Brown, and others — are conspicuous by their absence. M. Oudinot, who is, I presume, now to be reckoned among Boston artists, sends two fine pictures, of which No. 121 is especially pleasing, with its outlook from the edge of a shady wood over a verdant sloping meadow, in which nestles a village with its roofs and spire half seen among the tender foliage.

Mr. Foxcroft Cole and Mr. De Blois are the largest contributors, the one having sent four pictures, and the other five. Mr. Cole's include two or three water-colors from rural scenes in Normandy. His water-colors are pretty sure to be good, but he has rarely, I should think, shown anything more delightful than No. 34, a "Farm Scene in Sologne." Mr. De Blois has, it seems to me, made a great advance within a year or two. He has certainly never shown anything so good as these pictures, which with great variety of subject and treatment all exhibit great beauty of color and justness of drawing, combined with a certain seriousness of treatment which is very admirable. No. 149, a view on the Seine, with a village stretching along the farther bank, a picture not quite even in its parts, but very fresh and breezy in the right-hand half; and No. 92, a snow scene at Anvers, with a country road leading away into the picture, bordered by a garden wall on one hand, and a row of tall trees on the other, separating it from a snow-covered marsh, — the whole under a sombre, leaden sky, with a dull twilight glow in the horizon, — are two admirable pictures which certainly do not look as if they had come from the same hand.

There are no portraits of special interest except the vigorous but rather disagreeable picture of Mr. Appleton by Mr. Vinton, and Mr. Stone's unfinished portrait of Dengler, a mournful reminder of what must be regarded as no common loss.

The water-colors are not as numerous as usual, but they are interesting, and include some drawings by artists with names unfamiliar to me, which seem very promising. Number 33, for example, the "End of the Orchard," by Mrs. White, is very rich and strong in color.

The Museum of Fine Arts has many ways of justifying its existence, but I know of none more directly useful than the special exhibition of works in one or another branch of art which it arranges from time to time, and which offer to the public the best possible opportunities for education in those branches. Of these special exhibitions, that which is now open is one of the most interesting and valuable. A collection of between four and five hundred etchings by the greatest of ancient and modern masters has been brought together from many owners, and arranged on the walls and screens of the engraving room, so that all can be seen and studied with the utmost comfort and enjoyment. Many persons have a more or less intelligent love of etchings, and are to a greater or less extent collectors of them, who yet know very little of the capabilities of this art in the hands of such a master as Rembrandt or Seymour Hayden. To such surely never known before in this country of studying to the best persons this exhibition offers such an opportunity as they have as-advantage almost all the schools of etching which have prevailed from the earliest days of the art. The impressions are in most cases early and brilliant; in some instances the same plate is shown in different "states;" and, in short, there is little that can be learned of etching, short of taking the need e in hand under the master's eye, which may not be learned from careful study of this collection.

The catalogue alone is exciting. France is the home of this art, and the great painters of France, following the older painters of the Dutch school, are almost all etchers. We find here, therefore, the names of Millet, Daubigny, Rousseau, Meissonier, Fortuny, Corot, Delacroix, Gérome, Veyrassat, Jacque, and others, and last but not least Méryon, of whose etchings there are nearly thirty, mostly representing the picturesque streets of old Paris, "Méryôn's Paris," now vanished under the improving hand of Napoleon III. and the École des Beaux-Arts. The sombre vigor of these etchings, now extremely rare, and the extent to which they are infused with the strange and grotesque individuality of the artist, makes them very impressive.

Millet's etchings, of which there are six or eight in this collection, are full of the seriousness, the simplicity, and the homely grace which distinguish his charming pictures. No. 61, the "Wool Carder," is a beautiful example of these qualities.

The thirty etchings of Rembrandt which stand first on the catalogue are those with which we have been familiar as forming part of the Gray collection of engravings. They are of various degrees of excellence, some of the impressions being from plates greatly worn, while others are extremely clear and fine. A series of Turner's plates for the "Liber Studiorum" are also shown, all but one being in outline. They are, however, perhaps not the less interesting on that account, for they give the student a clear idea of the wonderful drawing which lay at the foundation of Turner's genius. The "Procris and Cephalus" is a finished mezzotint.

But in spite of the great names already mentioned, and concerning which I should like to particularize if space permitted, the interest of this exhibition centres in the etchings of Seymour Hayden and Whistler, which are so splendid in their strength and brilliancy, so varied in their subject, and so adequate to every expression as to form in themselves a most worthy and admirable collection. Mr. Hayden's subjects are nearly all landscapes, and include the very large etching of Turner's picture of Calais Pier, and a fragment of the same plate, printed when partly finished. Mr. Whistler's plates number fifty, and include his first series of etchings from scenes in Brittany. Whatever affectations or eccentricities this somewhat too much talked of artist may have acquired, there is nothing of the sort visible in these admirable works. They include all sorts of subjects, landscapes, interiors, street views, figure studies, finished with the utmost minuteness and conscientiousness.

The contributions of American etchers are not numerous, but they are extremely encouraging. I must not forget to mention as holding perhaps the most conspicuous place among them the works of our townsman, Mr. John A. Mitchell, the results of whose late studies in Paris are here to be seen in his large etching of the Place de l'Opéra, in which both the drawing and the rendering are very spirited. There are also here two series of slighter etchings by Mr. Mitchell, which are marked by the lively humor and ingenious fancy with which many of your readers are so well acquainted.

Mr. Swain Gifford has some half dozen fine etchings, very strong and firm, which gain something in effect from being printed on a strongly tinted paper.

A.

AN ARCHITECTURAL YEAR. — NEW CHURCHES. — PROGRESS ON THE LARGE PUBLIC BUILDINGS. — COMPETITIONS. — HONORARY ASSOCIATES, R. I. B. A. — THE YEAR'S DEAD.

London.

The year 1878 will be principally remembered in the world of art, as in that of industry, as the year of the Paris Exhibition; such a gathering of the arts — particularly those connected with architecture — has probably never taken place before, and great good may reasonably be expected to result therefrom. If for nothing else they enable us to compare results with our contemporaries from all

parts of the world; the opportunity was a great one, and it is hoped the many lessons to be learned from so much work will not be altogether forgotten. Here in England, the general dullness of business has affected the architectural professinn like the rest of the world, and as a consequence less has been done in the way of general work, while of the larger public buildings the most have only been advanced some stages towards completion; few have been finished and opened. Of the latter, one of the most important is the new cathedral church of St. Mary, Edinburgh, by the late Sir G. G. Scott, which, though still wanting in some of its adornments, notably the spires, is so far completed that it may now be opened for service any day. The work is being carried on by the sons of its late eminent architect, and when finished will be one of the most important churches built since the Reformation. It is also most characteristic of Sir Gilbert's style, notwithstanding the incorporation of Scotch features in its detail, and, we think, hereafter will be reckoned as one of his very best works; much more so, for instance, than his other great work in Scotland — the Glasgow University; here he has also sought to introduce Scotch features in the design, but whether it was because he was not so much at home in secular as in ecclesiastical architecture, the result is much more successful in the Edinburgh Cathedral than in the Glasgow University, where he has failed to catch the spirit of the grand old Scotch Gothic. The great hall of the University, which has just been commenced under the direction of his sons, may yet redeem, in some measure, the tameness of the general design.

Another large church finished during the year is St. John's, Red-Lion Square, by Mr. Pearson. This is a very fine church indeed; better even in some respects than the same architect's great church at Kilburn; like the latter it is Early English in style, built of red brick outside and stock brick inside, with stone finish in each case, and vaulted throughout. It has a very wide nave, a splendid chancel, and is intended yet to have a very noble tower and spire. The detail throughout is refined and delicate, without losing anything of the strength of early work. The morning chapel is a most charming piece of design, with particularly fine vaulting; indeed, the vaulting is one of the great features of the church, so admirably is it carried out. The east end, too, is marked by great dignity, and a certain originality of treatment, more especially in the circular termination to the turrets which flank the gable. Altogether, Mr. Pearson has proved by his work at this church, and St. Augustine's at Kilburn, how well earned has been his recent appointment as architect to the new cathedral for Truro. His design for the latter will be looked forward to with great interest. Among other smaller churches, Union Chapel, Islington, may be mentioned as noteworthy for being designed on the "Central Area" principle, the idea being to secure an unimpeded view of the preacher, and a large space for the congregation. The architect was Mr. James Cubitt, who has given considerable attention to this question, and in this case has been fairly successful. The general design is good, but the detail is lacking in refinement and feeling. The tower is not yet built.

Among secular buildings, each of the great works in the metropolis has been considerably advanced. The eastern block of the new Law Courts is finished, and the Strand front progresses favorably. It is impossible to tell what the effect of this building will be, even if it were fair to express an opinion on an unfinished work. The great feature of the design — the central hall — is begun, and goes slowly forward, but it must be years yet ere the courts will be ready for occupation.

Mr. Waterhouse's great terra-cotta pile at South Kensington is practically finished externally; and the coming year will most likely see it completed if not occupied. Another government building, the New Barracks for the Life Guards at Knightsbridge is slowly rising on the site of the old stables, — a huge pile in red brick with stone finish, which it is hoped will prove an improvement on the usual style of barrack architecture. Mr. Thomas Wyatt is the architect. Of other public buildings, the Opera House on the Thames embankment is still at a stand-still, and the long waited for Wellington Monument has been offered to public inspection. The late Mr. Stevens's scheme for the decoration of the dome of St. Paul's has been adopted, and is to be worked out from the model he left behind him. Full-sized drawings of about a sixth part of the surface are to be prepared and fixed in the dome, when some idea may be arrived at as to the probable effect of the work when finished.

Of minor secular buildings we have the offices of the Prudential Assurance Company by Mr. Waterhouse, a large block in red terra-cotta (Mr. Waterhouse seems to have taken up terra-cotta), but not very striking in general design or much better in detail; the City Liberal Club, by Mr. Grayson of Liverpool; the Gresham Life Office, by Mr. J. J. Cole; and the new offices of the Bank of Scotland, by Mr. Chatfield Clarke, the latter a handsome street front in the Italian style, with considerable dignity of treatment and excellence of detail.

Several important competitions have been decided during the year, among others, the Oratory Church at Brompton, won by Mr. Herbert Gribble, amid considerable dissatisfaction, his design being by no means the best from an artistic point of view. Mr. Waterhouse acted as "adviser" to the Fathers, but did not make the selection, only reporting on the relative merits of the designs. The Barrow-in-Furness Town Hall competition was won with a very good Gothic design by Mr. W. H. Lynn, Mr. Callcutt coming second with "Queen Anne." The Axton Public Offices fell to Messrs. Alexander & Henman, and the Yarmouth Town Hall to Mr. J. Pearce, the latter in florid Queen Anne of a very pictorial type. With these may also be classed the Reading Town Hall, the competition for which was so disgracefully conducted as to call forth the strongest remarks thereon, the work ultimately falling to the *referee* called in to award the prizes!

In June another architectural conference was held, but did not amount to much beyond a few pleasant visits to some public buildings, and some dry papers. The meetings might just as well never have been held. Several of the most prominent questions of the day were never touched upon, and the fact that architecture is still a fine art seems to have been lost sight of altogether. A little of the artistic element pervaded the gatherings. Why, it is still asked, do we find so few of the "artists" of the profession at either Institute or Conference meetings? A dozen names readily come to mind, who seem to care for none of these things, and yet they are those of the men who are doing the artistic work of the day. The Institute has recently created a class of "Honorary Associates," and elected many eminent painters and sculptors thereto, and yet many of the most artistic of our architects are conspicuous by their absence from its ranks. Is the Institute, which now takes in painters and sculptors, not broad enough or artistic enough for them? The question is often asked, but no satisfactory answer seems to be forthcoming; and yet if the Institute is to be to the profession what it seeks to be, the best men should not only be in it, but give to it all the support in their power by their presence and otherwise.

The obituary of the past year includes many well-known men, who will be missed. At the head of the list stands Sir G. G. Scott, the most eminent English architect of the day, the most thoroughly representative man the Gothic revival has produced, and one who hereafter will occupy a distinguished place in the history of English architecture. Mr. Sydney Smirke, one of the greatest leaders of the classic school, Mr. Bonomi of the same school, and also Mr. Nelson, architect of the United Service Club, Mr. Charles Summers, Mr. Lockwood, of the well-known firm of Messrs. Lockwood & Mawson, and last but not least, Mr. F. P. Cockerell, one of the truest gentlemen who ever adorned the profession. In common with all who knew him, it is with a feeling of the deepest regret the writer adds this last name to the list. His charm of manner attracted every one, his cultivated taste and genuine artistic feeling were apparent in all he did; gallant, chivalrous, and honorable in all his dealings, he nobly carried on his family traditions, and, like his father before him, was ever, in the highest and best sense of the word, an artist among gentlemen, and what is more, a gentleman among artists. In his practice he may be said to have been the representative of English classic, as apart from the French or Italian versions of the school; and of this he has left us some most interesting examples. His houses were neither Italian villas nor French châteaux, but the houses of English gentlemen in that phase of the Renaissance which is peculiarly English; with the Queen Anne School he had but slight sympathy, though in many respects his own work came so close to the best work of our latest revival. His education was too classical to allow him to be led away by its eccentricities, while his prediction that it would yet develop into something more truly classic in style, seems very likely of fulfilment. One of his works finished during the year — the additions and alterations to St. John's Parish Church, Hampstead — deserves more than a passing notice in our record. This is a well-known church in the English classic style above referred to, and erected about the middle of last century. Its copper-covered spire forms a picturesque object in the landscape. It had to be enlarged to accommodate the increasing wants of the parish. For various reasons, artistic and otherwise, it was undesirable to touch the old tower and spire, which, by the way, stand at the east end of the church. As extension in this direction could not very well be had, and a good chancel was absolutely wanted, Mr. Cockerell, with his usual practical common sense, turned the whole arrangement round about, and built the new chancel at the *west* end. Such a proceeding would naturally shock a High Church architect, but that it was the right thing to do is abundantly proved by the result. Outside, the church has no pretensions to architectural display, but the interior is very good: a barrel-vaulted nave separated from the side aisles by Ionic columns, with quasi transepts at the west end; beyond these transepts Mr. Cockerell has designed a beautiful chancel, carrying on the order with pleasing variations, with all the feeling of the old work and most carefully detailed. The arrangement of the west wall with the altar and reredos is particularly good, and all the fittings, such as stalls, reading-desk, altar and chancel-rails, vestry-screen, etc., are extremely well designed. The general seating of the church has been rearranged to face the west, and the gallery fronts remodelled. Thus, the interior now forms a harmonious whole, increasing in richness towards the chancel. The work has been carried out with consummate taste and skill, making one regret more than ever that the hand which designed it all is now at rest. One of the windows has been filled with painted glass in memory of Sir G. G. Scott, who resided for many years in the parish. Let us hope another may be devoted to the memory of the gifted architect to whose genius the church now owes so much.

The mention of the style of this church reminds one that during the year the current of thought pervading our latest revival, if setting anywhere at all, is tending steadily in the direction of a more

classic development. Churches of the date of St. John's, Hampstead, not so long since were considered beneath notice; now they are looked upon with a considerable amount of respect. Is it because we are becoming more classical? Or that we are finding out they are very English? Anyhow, the mediæval feeling in design is on the wane, and the change of style through which we are passing is a problem which will have solved itself ere many more years have come and gone. As a contribution towards such solution, the general work of 1878 must be looked upon as having given us many promising examples, full of encouragement for the year that is begun, which we may be permitted to hope will prove a very successful one, from an artistic as well as a practical point of view.

A NEW STATUE OF WASHINGTON.

Of Mr. Ward's new statue of Washington, which Mr. Daniel I. Tenney has given to his native town of Newburyport, the New York *Tribune* says: —

Mr. Ward has done his work well. If it was not to be looked for that he should put any originality into his treatment of so well worn a theme, we are at least gratified that he has succeeded in presenting Washington to our eyes in a more genial and sympathetic mood than has been the wont of sculptors hitherto. We must interpret his design as representing the hero addressing his countrymen on some public occasion, and that not a sad one. The figure, of heroic size (eight feet in height), is firmly but lightly poised on the left foot, and the left hand rests strongly on the sword which, with its belt hanging about it, serves as a still further support. The right hand is thrown out backward from the body with excellent effect, as if it were just on the point of being brought forward and up, in a swift, concluding gesture. The head is animated, and moves with the body, while the usually grave features are lighted up with a benevolent smile, the expression of that deep feeling which formed so essential an ingredient of Washington's nature, but with which he is so little credited. It is hardly possible to judge a statue of this size in a place comparatively so small as is even the large and lofty wareroom of the Gorham Company, but we shall be much surprised if, when it is placed on the eight-feet-high pedestal that has been designed for it, and in the light of the public square, it does not make a strong impression of unity in its conception and in its execution. It is a simple, direct, manly work, and Newburyport may well be congratulated that one of her sons has been moved to enrich her with such a gift, and that the execution of his generous purpose has been intrusted to a hand so well able to carry it out.

PUBLICATIONS RECEIVED.

Geological and Geographical Atlas of Colorado and Portions of Adjacent Territory, by F. V. Hayden, U. S. Geologist in Charge, 1877. Department of the Interior. United States Geological and Geographical Surveys of the Territories. Julius Bien, Lithographer.

NOTES OF EXPERIENCE AND INEXPERIENCE.

[INEXPERIENCE.]

1. Roofing Paint. — Does any one know of a well-ground and good mineral paint, suitable for painting roofs of picturesque country houses, without mixture with any other color?

Prince's paint and Brandon brown are heavy in effect. Venetian red is too lively for a large house; Indian red is beautiful, but very expensive, and not very permanent. The reds obtained by adding vermilion to other colors are still more fugitive and are dangerous where the roof water is collected in cisterns. The Kahtadin paint is of a dull color and coarsely ground; the Iron-clad (Ohio) paint is fine and of good body, but the red color is not bright enough. The so-called Rocky Mountain paint seems to have no fixed composition; samples of it vary widely in color. Y.

2. Demarest's Water-Closets. — The writer wishes to know what precautions are necessary to insure the proper working of the Demarest patent water-closets. The directions issued by the manufacturers are well enough so far as they go, but even with these, and the services of a very skilful plumber, he was obliged to have them removed from a house where they were placed in accordance with the specifications, because they leaked constantly, so that the water had to be shut off at the tank while the closets were not in use. In the Elevated Railway stations in New York, however, they appear to work to perfection. One very good plumber tells me that he succeeds, by inserting a filter in the course of the supply pipe, to keep back all particles of sediment or sand which might get under the plunger.

The writer would be glad to use them on account of their superior cleanliness, and has specified them in several cases, but remembering his past experience, and not being able to obtain any new light on the subject, he has countermanded them before the work was executed. X.

[EXPERIENCE.]

Incrustations on Walls. — Some attention has been paid lately to the subject of the incrustations of magnesia and other salts which disfigure many walls, especially brick walls newly laid with cement. Whatever may be the cause of the trouble, whether the use of coal containing iron pyrites in burning the brick, or some other circumstance, it is certain that the addition of cement to the mortar used in laying them greatly increases the evil, and every one does not know how it may be prevented.

General Gillmore's experiments showed that the addition of any kind of fatty substance to mortar made with clear cement or with lime and cement in different proportions, to the amount of eight to twelve pounds of fat or grease to a barrel of cement, would prevent efflorescence, and many country masons retain a tradition of putting linseed oil in mortar containing cement. We have found in practice that the addition of linseed oil in the proportion of two gallons of oil to each cask of cement, whether the cement were used clear or in mixture with an equal or greater quantity of lime, was sufficient to prevent any efflorescence on the walls laid with it, even under unfavorable circumstances, such as the soaking of a portion of the masonry with rain before it was covered in. Less than that proportion of oil may answer in some cases, but cannot be entirely relied upon. Pyrites.

NOTES AND CLIPPINGS.

London's Water-Supply in the Olden Time. — During the reigns of Queen Elizabeth and James I. acts of Parliament were obtained for the better supplying of the metropolis with water; but the enterprise seemed too great for any individual, or even for the city collectively, to venture upon, until Mr. Hugh Middleton, a native of Denbigh, and goldsmith of London, offered to begin the work. The Court of Common Council having accepted his offer, and having vested him with ample powers, this gentleman, with a spirit equal to the importance of the undertaking, at his own risk and charge, began the work. He had not proceeded far when innumerable and unforeseen difficulties presented themselves. The art of civil engineering was then little understood, and he experienced many obstructions from the occupiers and proprietors of the lands through which he was under the necessity of conducting this stream. The distance of the springs of Anwell and Chadwell, whence the water was to be brought, is twenty miles from London, but it was found necessary, in order to avoid the eminences and valleys in the way, to make it run a course of more than thirty-eight miles. "The depth of the trench," says Stowe, "in some places descended fully thirty feet, if not more; whereas, in other places, it required as sprightfull arte againe to mount it over a valley, in a trough betweene a couple of hills, and the trough all the while borne up by wooden arches, some of them fixed in the ground very deepe, and rising in height above twenty-three foot." The industrious projector soon found himself so harassed and impeded by interested persons in Middlesex and Hertfordshire that he was obliged to solicit a prolongation of the time to accomplish his undertaking. This the city granted, but they refused to interest themselves in this great and useful work, although Mr. Middleton was quite impoverished by it. He then applied, with more success, to the king himself, who, upon a moiety of the concern being made over to him, agreed to pay half the expense of the work already incurred, as well as of the future. It now went on without interruption, and was finished according to Mr. Middleton's original agreement with the city, when, on the 29th of September, 1613, the water was let into the basin, now called the New River Head, which was prepared for its reception. By an exact admeasurement of the course of the New River, taken in 1725, it appeared to be nearly thirty-nine miles in length; it has between two hundred and three hundred bridges over it, and upward of forty sluices in its course; and in divers parts, both over and under the same, considerable currents of land waters, as well as a great number of brooks and rivulets, have their passage. This great undertaking cost half a million of money, and was the ruin of its first projector, some of whose descendants have received a paltry annuity of £20 from the city that was so much benefited by the work by which they were rendered destitute. The property of the New River is divided into seventy-two shares: for the first nineteen years after the finishing of the work the annual profit upon each share scarcely amounted to 12 shillings. A share is now considered to be worth £11,500, and they have been sold as high as £14,000. — *Exchange.*

How Dynamite is affected by Water. — It has recently been shown that if dynamite is poured into water, the sand falls to the bottom and the nitro-glycerine floats on the surface, and explodes with its usual violence if the temperature is slightly increased. This will explain the cause of many of the serious explosions with dynamite when used in wet holes.

Tree Cutter. — A machine recently invented by Messrs. A. Ransome & Co., saw-mill engineers, of Stanley Works, Chelsea, London, England, consists of a steam cylinder of small diameter, by a long stroke attached to a light cast-iron bed-plate, upon which it is arranged to pivot on its centre, the pivot motion being worked by a hand wheel turning a worm which gears into a quadrant cast on the back of the cylinder. The saw is fixed direct to the piston rod, which is made to travel in a true line by guides, and the teeth of the saw are of such a form as to cut only during the inward stroke. By this simple device saws ten feet long can be worked without any straining apparatus or guide, as its own cut is sufficient to guide the saw in a straight line through the tree. As the teeth offer no resistance to the outward stroke, all possibility of the saw buckling is avoided. The entire engine is supplied with steam at high pressure from a small portable boiler, through a strong, flexible steam pipe. The tree-feller as at first introduced required four men to work it, — one to guide the machine, one to drive wedges into the cut to prevent the tree from pinching the saw and to control the direction in which it falls, one to stoke the boiler, and the fourth to clear away underwood; and the united exertions of the four men were required to remove it from tree to tree. Messrs. Ransome have now constructed a light, two-wheeled carriage, with a long lever handle, by which the machine, by being merely hooked on to the short end of the lever, is held suspended between the wheels, and in that position is readily moved by one man, and so the total staff is reduced to three men. — *Milling and Mechanical News.*

Companions in Misfortune. — The *Athenæum* mentions that recently a picture by Mr. Whistler was exhibited in public, and neither judge nor jury could tell which was top and which was bottom. It also narrates as a companion story, which is vouched for as being even more true, that at the Winter Exhibition of the Society of Painters in Water-Colors, in 1873–74, "a lovely and elaborate architectural drawing by Mr. Ruskin was placed upside down, not by a porter of a court of law, but by persons employed by an eminent artistic body. Thus it remained for a time, until some sharp-eyed visitor discovered the fact." The drawing thus subverted was a "Study of the Colors of Marble in the Apse of the Duomo of Pisa."

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BOSTON, FEBRUARY 15, 1879.

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We read of the death of M. Joseph Louis Duc at Paris, on the 23d of January. M. Duc's name is familiar to most of our readers as that of one whom his countrymen delighted to honor, and the last foreigner to whom the English Royal Gold Medal for Architecture was not long ago awarded by choice of the Council of the Institute. He was a member of the French Institute, commander of the Legion of Honor, Municipal Architect of Paris, held many official appointments under the government, and was the only recipient of the extraordinary prize of one hundred thousand francs which the late emperor decreed should be given once in five years to some most distinguished artist. His greater honor was that he was one of the handful of men who early in the reign of Louis Philippe lifted French architecture out of the dull formalism into which it had fallen, and gave it the upward impulse which lasted for a generation. Duban, Duc, Henri Labrouste, and Vaudoyer, the four men who gave shape to what is since called the neo-Grec movement in French architecture, were students together at the Academy at Rome fifty years ago, having taken the grand prize at the École des Beaux-Arts in successive years. Inheriting the admiration for Greek art which was universal at the beginning of this century, they were further stimulated by the researches of the French archæologists, especially by those of which Hittorff was then first publishing the results, and afterwards by those of Texier. They were men of power, and, being full of enthusiasm for the newly discovered materials, set themselves to work, in contrast with the servile imitation of their predecessors, to bend these new materials to the service of their own art. The first work in which the influence of the new movement was shown was the famous Column of July, in the Place de la Bastille at Paris. This work M. Duc inherited from Alavoine, to whom it had first been awarded, and to whom on his return from Rome he was assigned as inspector. Alavoine died, however, when the foundations of the monument were hardly laid, and the whole merit of the executed design is ascribed to M. Duc. The admiration it called out was extreme, and it at once gave its designer the preëminence in his profession which his later work confirmed to him.

M. Duc was born in Paris in 1802, studied architecture first under Châtillon, an architect of eminence, himself a *Pensionnaire de Rome*, and a pupil of the famous Percier. He entered the school, and in 1825, as we have said, carried off the grand prize, his project being a Hôtel de Ville for Paris. He returned from Rome in 1831, and was appointed to his inspectorship under Alavoine, whose death in 1834 left him in charge of the Column of July. This was finished in 1840; its success won him the decoration of the Legion of Honor. Ten years later, in 1850, he was given charge with Dommey of the restoration of the tower of the Palais de Justice at Paris; afterwards the farther restoration and enlargement of the building was put into his hands. Upon this work he spent several years, in the course of which he was chosen a member of the Institute. The façade which he built on the side toward the Pont Neuf — the famous front of the Cour de Cassation — brought him the honor of being selected in 1869, by his colleagues of the Institute, from among a large number of painters, sculptors, and architects, to receive the extraordinary prize of which we have spoken. Out of this sum of one hundred thousand francs he established an annual prize which is called the *Prix Duc*, to be given every other year to the French architect who shall be judged by the authorities of the school to have done the most noteworthy piece of architectural work in the preceding interval, account being made, not of the magnitude of the work, but of its artistic quality simply. His *magnum opus*, however, that which has given him the highest position among his fellows, and won him the warmest praise from critics of such different points of view as MM. César Daly and Viollet-le-Duc, is the *Salle des Pas Perdus*, or waiting-hall, which he afterwards added to the Palais de Justice, and which was barely finished when the Franco-Prussian war broke out. In the mean time he had been associated with M. Vaudoyer as architect of the new cathedral of Marseilles, a building of very different style from M. Duc's neo-Grec work, though related to it, being in a kind of modified Byzantine, and of which the design was M. Vaudoyer's only, we believe. In 1862 M. Duc was made Officer of the Legion of Honor, and afterwards Commander. It was in 1876 that the English gold medal was awarded him. He was the last survivor of the four friends who had the force to give a new direction and a new life to the French architecture of this century. It does not yet appear that they have left any successors to their power. Their works were not many, but the influence of them remains and will remain, and none have had a greater or more honorable influence than those of M. Duc. His career is a shining example to an eager profession to show how much better are a few works where they can be wrought out with one's utmost skill than many done in haste.

In a late number of the New York *Sun* is a reporter's account of an interview in which the president of the Ætna Insurance Co. described some peculiarities of the construction of the Worth Street building, lately burned in New York, that will help to account for the rapidity with which the fire spread from store to store. The front, as is known, was of iron. The large piers which divided it into sections corresponding to the stores were boxed, as they naturally would be, and left hollow and open at the back, the brick partitions which divided the stores not being carried into them, so that until the finish was put up there was room for a man to pass round the ends of the partitions from one to another through the interiors of the piers. Some of these hollows were simply closed with wooden doors and used as cupboards. This may be an extreme case, but the kind of construction is one that is common in iron buildings, and that makes our present manner of using iron a dangerous one. That the fire did actually pass from store to store in a way that puzzled the firemen is in evidence, and here is a reasonable explanation of how this could happen. The massive-looking cornices of galvanized iron that crowned the building are also complained of. They were of course a thin shell, and the great hollow which they enclosed was continuous along the front, as it usually is; through it the flames easily went where there was anything to lead them. Here we may correct a mistake into which we fell while speaking of this fire and that in the Honoré building in Chicago, in our number for January 25, the result of misunderstanding certain information concerning the two fires received in one letter. It was in this same Worth Street building, and not in that at Chicago, that the wooden floors, resting on iron columns and girders that yielded to the heat, and falling, in one case pulled away the partition to which they were anchored and so let the fire through. It was stated as a curious fact that in one of the New York fires it was found that the use of the elevator had led to flooring over the stairways, so that the firemen could not carry their pipes up in the building. The elevators, on the other hand, gave passage to the flames, but not to the firemen.

The writer of a lively letter to the Boston *Herald*, who claims to be an adjuster of losses by fire, signing himself Parsee, which we may assume to mean a fire-worshipper, takes the opposite tack, and soundly commends the buildings of the day, especially the churches, as being most cleverly contrived in the interest of such as he. Our buildings are, in truth, ingenious combinations of flues greater or smaller, mostly of combustible substance, and commonly of thin material, set side by side across our floors and up our walls, opening out here and there into hollow spaces walled with wood, and out of our reach. Every fire that occurs

gives us new warning that our way of building is unsafe. All our common methods have been developed in the effort to attain one class of qualities, — lightness, quickness and ease of construction, and economy, or rather cheapness. As usually happens to people whose aims are one-sided, we have got into trouble. Our buildings do not last; often they will not bear the use we put them to; they burn like straw. Other people have found out how to build better than we, but we like our own ways, and we will learn nothing from them. We box our floors with thin plank set edgewise, our partitions with smaller pieces of the same stuff; we fur our walls with strips of the same. Then we case all in with thinner boards and friable plaster on still thinner lath. The building is a series of communicating flues partially protected outside, but wholly exposed within, through which fire and vermin may play at will, and through which we cannot trace them till they have done their mischief. All this is convenient and cheap, for it is quickly put up and takes little material. If we use iron, as we must, we make it hollow also for strength's sake. This would do no harm if the hollows were no larger than they need be, and were properly closed in; but we build great boxes to simulate masses of stone, and we expose them to the fires of blazing wood which we know will destroy them. At the persuasion of underwriters we put up cornices of galvanized iron, which will not themselves burn, but which are thin shells furred upon wood, and will at once convey and conceal the fire behind them. It would not be easy to devise anything which should better suit the business of our adjuster of losses. When we are fairly converted from our narrow ideas, and have learned to take a broad view of the requirements of good building, we shall set ourselves to mend our ways, and shall adopt or contrive a satisfactory system of construction. Till then we shall suffer.

The Italians are proposing to build a national monument to Victor Emmanuel, which it is expected will cost ten millions of francs. One would have supposed that for a monument to the restorer of the unity of Italy, the rebuilder of the Italian nation, no artist but an Italian would be thought of for a moment; but it is said that a competition for the design of the monument will be thrown open to all the world. The scheme proposed is a triumphal arch with a colossal equestrian statue of the king upon it. The thought suggests itself that one reason why modern designers develop so little that is new or valuable in the forms of public monuments is that the persons who want a monument are so apt to prescribe the form for it, thus limiting their designers to such few well-worn and therefore uninspiring types as are likely to suggest themselves to patrons instead of artists, — to such therefore as make the task of the modern artist doubly difficult by forcing him to direct competition with the master-works of an older time. To build a triumphal arch at Rome is to obtrude one's self into a company whose dignity may well appal modern modesty, if that quality still lingers among Italian artists. And yet there certainly is no city in the world to which this form of monument is so distinctively appropriate, nor any sovereign of late days to whom such a memorial might with so good a grace be built.

The English labor war is far from exhausting itself. The strikes in the iron trade have spread, and the defeat of the men in one place does not prevent their resisting in another. It was expected that twelve hundred engineers would be on strike in London this week. The disturbances in the cotton trades and among the miners do not cease. In Liverpool the disorganization is almost unparalleled. A strike of the dock laborers against a reduction of wages brought on one among the coal-heavers out of mere sympathy; they have been joined by sailors and others, until it is estimated that more than fifty thousand men are on strike, and the business of the city is at a standstill. In all the trades throughout England there is disquiet, the building trades being greatly disturbed and strikes frequent. The masters, however, persist in the reductions which are gradually enforced through all trades, and are their only condition of continuing work at all. What with low wages and idleness, voluntary or compulsory, the condition of the laboring class is one of unexampled hardship. A late writer in the London *Times* gives some statistics of last year, from which it appears that of three hundred and seventeen strikes recorded during the year in all countries, two hundred and seventy-seven were in England. The greatest number were in the building trades and in mining, there being sixty-seven in the one and sixty-six in the other; fifty-eight were in the cotton and woollen manufactures, and thirty-nine in the iron trades. The apparent hopelessness of the struggle on the part of the men, and the desperation with which they resist the inevitable, are shown in the fact that out of the whole number only four strikes are found to have really succeeded and seventeen to have led to compromise. This is obviously due to the fact that the men are fighting, not against their masters, but against the pressure of a universal disaster, which the masters have been the first to feel. War under such circumstances is a double injury to the men; for not only does it exhaust them, but in so far as they succeed in crippling their employers they are destroying the power to which they must look to build up prosperity for themselves again when there is opportunity.

The demands of the States which are concerned in the improvement of the Mississippi, and the various schemes for its regeneration which have been brought forward by Mr. Eads, Captain Cowden, and others, have led to the bill for its improvement which has at our time of writing passed the House of Representatives. It provides for a commission of five, to be appointed by the President, three of whom shall be army engineers, and two civilian experts at salaries of three thousand dollars each. It is to study the river from Alton, Ill., to its mouth, making such surveys and investigations as it finds necessary. The commission's office will be no sinecure, for it is to consider the various projects proposed for improving the river, and especially to examine and report upon the three schemes which have been bones of contention among the engineers who have studied this river — and many who have not — the jetty system, the levee system, and the outlet system, deciding upon their practicability, their advantages, and their cost. It is to prepare and submit to Congress a matured plan, with estimates, for redeeming the whole river from Alton down, defining, deepening, and maintaining its channel, restraining floods, and protecting the alluvial lands of the lower valley. If its plans are approved and adopted by Congress, it is to carry them out under the authority of the Secretary of War, submitting annual reports and estimates as the work goes on. The original provision for expending three millions on the present levees and their crevasses is omitted, and the bill provides an appropriation of $250,000 for the expenses of the commission.

MODERN CHURCH BUILDING. I.

As a rule, in matters of architectural design, the least taste is shown in cemetery work and public monuments; and church building is but little in advance of these. That all undertakings that involve art-culture should, in a new and rapidly growing country, fail of great success, is natural; but that buildings erected by individuals, for their own profit or comfort, should far excel public edifices in beauty and fitness seems unnatural and unaccountable.

From remotest time and in heathen nations the places set apart for public worship have been marked by a liberality of expenditure of money, labor, and skill nearly always commensurate with, and often far in advance of, the civilization of the people. In many a land to-day, where the homes of past generations have faded away and left no trace, the temples of the gods still stand in solitary grandeur. In a new era of decay many American churches would be among the first to yield to the ravages of time; and even the half-ruined and half-restored cathedrals of the "mother country" would be likely to outlast them.

It may be that this is right; that the day for monumental churches is passed; and that the forms, or lack of forms, of an advanced religion require new surroundings in keeping with their observances. If such is the case the change of requirement should lead to a corresponding radical change in construction and design.

For the consideration of the moral issues involved this is no place. It is proposed to discuss here practical questions only. Given certain uses for a class of buildings, are such buildings constructed and arranged in the most suitable way for such uses, and does their design fitly express the object for which they were intended?

For the present purpose, Christian believers may be broadly divided into two large classes: First, those whose public ceremonies are of the processional or spectacular order, based upon the traditions of the remote past, and giving little prominence to the spoken discourse; and, second, those to whom the church is simply a lecture or preaching room, in connection with apartments for social intercourse and moral and mental culture, or even amusement. These latter require accommodations for various exercises and ceremonies, ranging from catechizing and the charity-school to amateur theatricals and dancing. The former class look upon the church as a consecrated place, whose cold stones even are endowed with sanctities; and many of the latter consider their modern meeting-house as the convenient location of a religious and social club, whose only holiness is in the good that follows the daily life of its members.

The Catholics, and the Ritualists among the Protestant Episcopalians, constitute, in this country, the majority of the former; and the remaining Protestant sects the bulk of the latter. This classification is of course somewhat crude and arbitrary, and is made for the consideration of questions of building mainly.

While the great body of Christian churches is thus divided, in the study of their practical wants in the art and science of architecture, certain requirements are, or should be, common to all.

Whatever their creed, on certain ground all Christians meet in equality. They are all striving for happiness attained through virtue and faithfulness to the religious observances of their choice. To each then the temple of his faith, whether viewed as a consecrated shrine, a church for preaching, or a moral lecture-room and social club-house, represents to each the local habitation of all that is best and noblest in his life. It should follow then that the building should be the exponent of the best science and art of the day. If not strictly monumental, it should at least be more substantial and durable than structures devoted to baser uses. If not crowded with pictures and statues, the taste shown in its simpler adornment should be of the most refined and elevating kind. Its fitness to use should be perfect. There is no religion that deserves the name of Christian that would promote physical discomfort or the loss of health as a part of its observance. Honesty, in its strictest sense, should be incorporated with every day's labor and every stick and stone of the Lord's house. A church debt is the worst form of desecration. There should be not only a fair and liberal management of its business transactions, but all concerned should be induced to labor with enthusiasm. It is specially important that the artistic design, from its first inception, should be heartfelt work, and that the architect should be untrammelled and free to do the best in his power. And here we come in contact with the most common error committed in connection with church-building projects. An individual, proposing to build for himself, selects from the list of available architects one whom he considers fitted for his purpose. He is guided in his selection by the same sort of reasons which might lead him to choose a lawyer or doctor. If either of the latter importunately urged his own employment, his claims would doubtless be set aside as not worthy of consideration. There is a kind of modesty in real merit that is recognized by the wise man of business, and he is as likely to give it weight in building as in other undertakings. The work done by the candidate for others; his natural qualifications and opportunities for education; his judgment and taste, diligence and integrity, — these are the proper guides in selection. The power to produce, by hook or by crook, delusive show-drawings, or even to manipulate and influence building committees, is no evidence of commanding genius. The ordinary, sensible way in all matters is more likely to lead to successful results than any other.

Church committees usually begin with an effort to obtain the work of many, when they mean to pay for that of but one. They institute a competition and invite architects to submit designs. Unfortunately, there are only too many of a certain class ready to do so. The temptations of this course, though resulting almost invariably in conspicuous failure, continue to have a strange fascination for the inexperienced. Committees still ignore the fact, that even though they may possibly be able to judge in a measure of the practical, or even of the artistic success of a finished structure, to judge of the same qualities in a proposed building, with no guide but a set of sketches, is a feat that tests to the utmost the skill of an expert. An architect himself may be often led astray by the deceptive qualities of his own drawing.

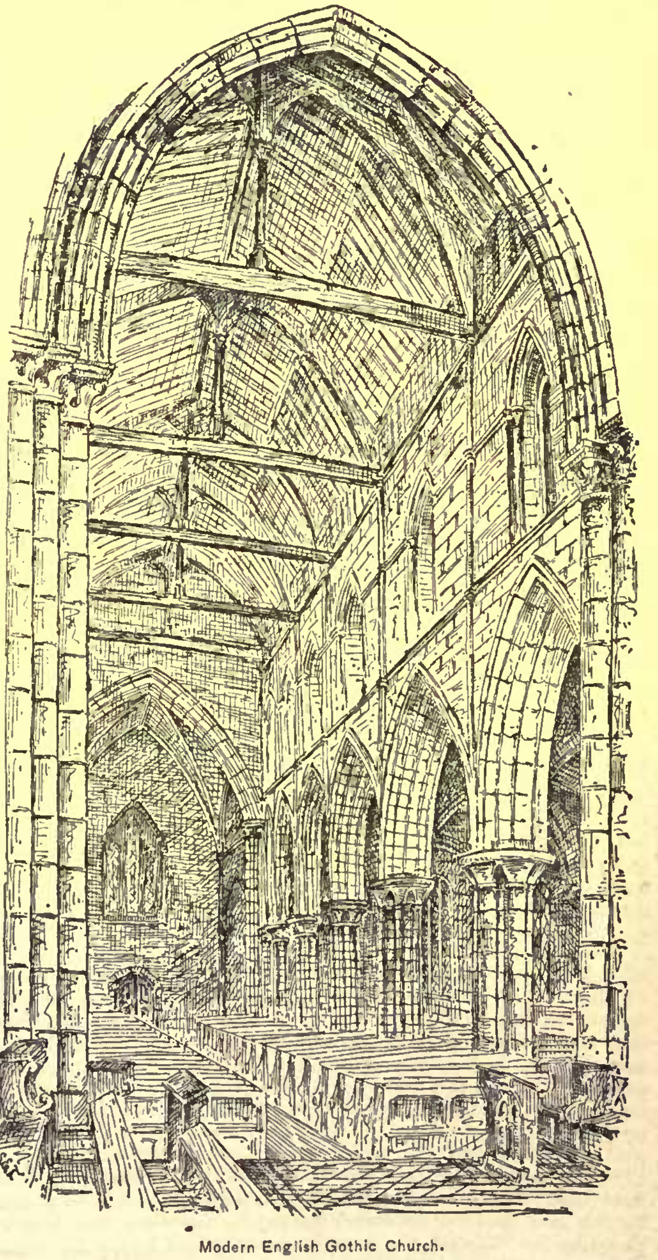
In an unpaid competition the interests of designer and employer become antagonistic, instead of harmonious, as they would be in case of engagement of the former in the ordinary way. It is useless for the aspirant for a money prize, or possible further work, to give his best service; and to portray what shall be stable, economical, and suitable, and consequently beautiful. These qualities are not showy enough for this sort of hap-hazard success. It is for his interest to submit fascinating pictures, the superficial attractions of which may captivate the inexperienced and unwary, and thus lead to profit to himself. This is common human nature. The committee may give their labor for the cause of the church they are interested in, but they cannot expect the ordinary service of the world on the same terms.

In the religious architecture of the Middle Ages most of the culture was monopolized by the clergy and the monks; and they were, no doubt, in most cases, the architects or master builders of the churches. In these later utilitarian days the spiritual and the practical are more widely separated; and when we speak of the artist or the artisan having his heart in his work, it is only in a restricted sense. He may have the real enthusiasm of the true artist; but this must be sustained by the certainty of fair remuneration for his time and support for himself and family. The neglect of these ordinary precautions at the start leads to failure in many ways. The lack of this simple justice in dealing leads often to failure; and the conduct of an important project either falls entirely into incompetent hands, or is marred by officious and ignorant intermeddling. Economy gives place to extravagance, and a desire for display leads to inferior and unstable construction. And so the first lesson of a new church is likely not to be the lesson of a good example, but a lesson of some of the worst ways of the world.

In the need of wise inception and prudent and honest conduct, from the first sketch of the design to the last touch of the decorative artist, the churches of all denominations are alike; but in all other matters they differ widely.

The Catholics, and others who adhere to the ceremonies of the remote past, have handed down to them, in the various Gothic styles, those eminently suited and originally intended for such uses. Even the custom of designing on a scale so vast and monumental as to be beyond the hope of immediate completion seems entirely consistent with the nature of their faith and the reverence of their observances. To them the church or cathedral is the visible emblem of adoration, — an adoration not of the day or hour, but of generation after generation. Buildings suited to such a religion must be slow of growth, on account both of the cost and of the permanency of such undertakings.

With most of the Protestant sects of America, however, the conditions are radically changed. Their need is for churches within the present means of the regular occupants; cheerful, comfortable edifices, with good acoustic qualities. Although the style may vary, there is one that is utterly unsuited to the use of any of them: and that is the style of a Gothic cathedral or any approach to it. It has no more affiliation with modern Protestant worship than that of a Hindoo temple, a Turkish mosque, or a Roman basilica. Almost every distinguishing feature of mediæval church design is specially unsuited to present use. The cruciform plan; the division into nave and aisles by obstructing columns; the open timbered or vaulted roofs; the extreme height and length; the traceried windows and stained glass; the paved floors and interior stone or brick faced walls; all that we have been taught to admire in song and story and pictorial art are as foreign to Protestant worship as the barefooted friars, the sackcloth and penance, the processions, the incense, the relics, and the confessional.

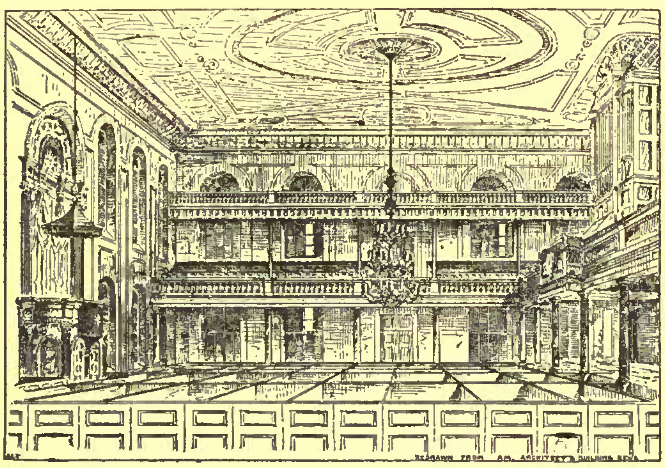


Modern English Gothic Church.

The record of modern Gothic church building, and of the use of the old cathedrals and churches for preaching, is of one continuous struggle against the unfitness of the style for its attempted uses. Our daily life cannot be properly lived in a donjon tower, or even in a baronial hall; nor can we with comfort or propriety wear plate ar-

mor or wield the ponderous broadsword. Why then should the religious observances of the day be trammelled by the dress or lodgings of the past?

The practical requirements of Protestant worshippers must be studied afresh, and free from any restrictions of unreasoning tradition. Starting with the bare arrangement of room or rooms best suited to the known or supposed needs of the occupants, from this beginning must be evolved the new church. Nor does this necessitate the invention of a new architectural style. Good styles are not invented; they grow, gradually. We are the heirs of the past in architecture as in religion and science. All that is true and good and fit, after modifying and adapting it to suit our new requirements, we should retain. All else should be discarded. It cannot be shown that the Gothic builders of cathedral or chapel ever copied or adopted features of plan or design unsuited to the uses for which they were striving. In fact, it is well known that while changes were gradual, keeping pace with the changes in forms and creeds and the progress of the church, each new want was boldly met, and in a freedom of spirit which promoted steady growth towards perfection. Nothing was imitated because it *had* been good. It was reserved for the servile archæological spirit of to-day to masquerade in borrowed, ill-fitting, and uncomfortable robes. Even in following the absurd fashion of copying slavishly from the past, if Americans had confined their imitation to the precedents furnished by their own colonial work, they would not have gone so far wrong. Some of the wooden



The Old South Church, Boston.

"meeting-houses" of a hundred or more years ago were better places of worship than the Gothic usurpers that threatened for a time to supersede them. They were often light, cheerful, good for seeing the pastor and people and hearing the spoken words of the former. Though not always comfortable, they were in keeping, in that particular, with a time when what is now considered comfort would have been esteemed the luxury of degeneracy.

AMERICAN INSTITUTE OF ARCHITECTS.

Report of the Committee of Ways and Means of the American Institute of Architects at their Twelfth Annual Convention.

To the American Institute of Architects, — The resolution passed by the Eleventh Annual Convention of the Institute, in virtue of which your committee was appointed, directed them to present to that convention an estimate of the probable expenses of the year 1878, and after assigning to these expenses the amount of money to be raised by the direct tax upon Fellows and Associates at large, as set forth in the resolution, to adjust the assessments to be levied upon the chapters according to their membership in place of the direct fees remitted by the resolution, as should be needed to make up the balance of the expenses.

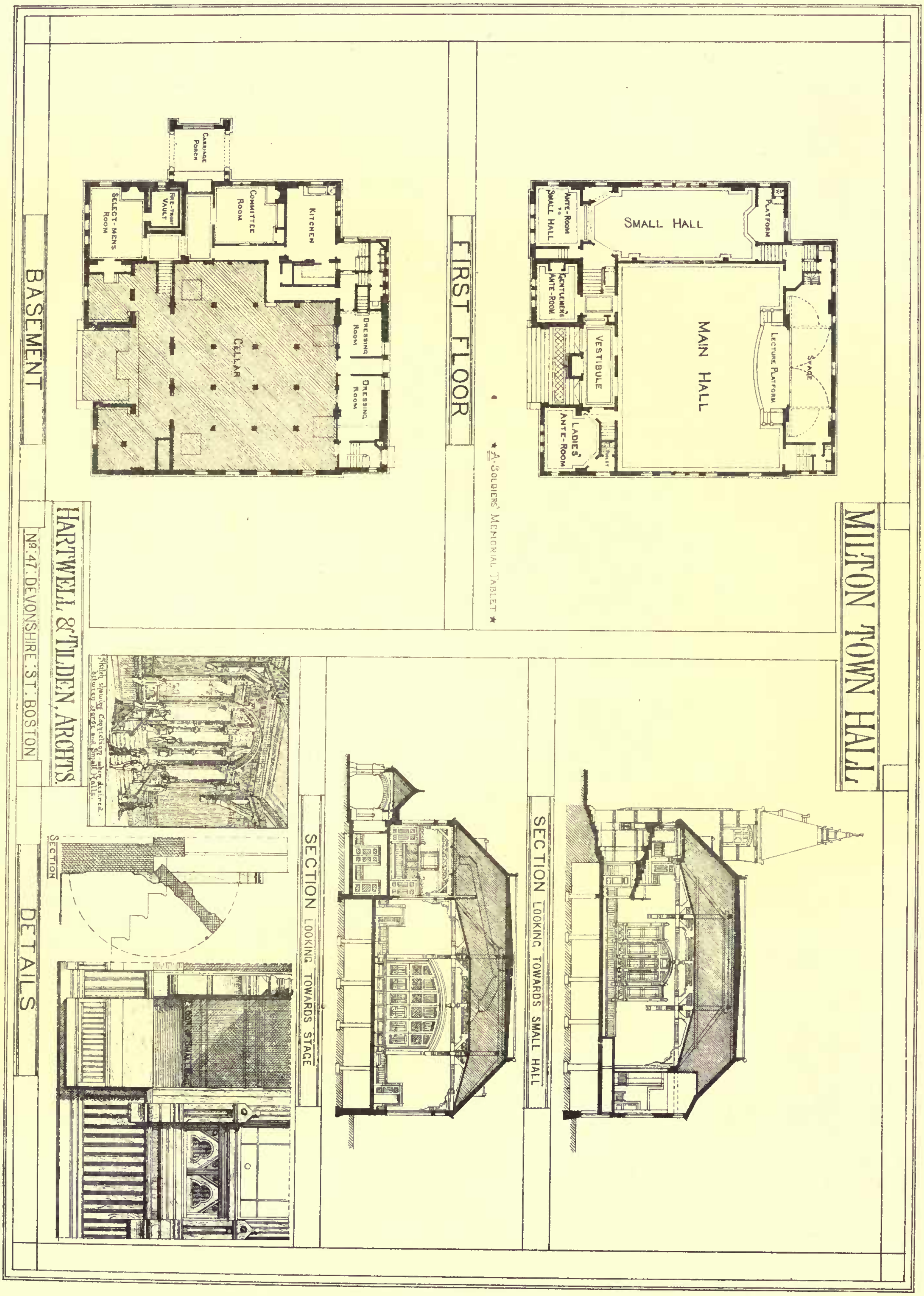
Your committee accordingly reported to the convention an estimate of the expenses of the current year, — of the amount of money which would be furnished by the diminished assessments, and the amount which it would be necessary to raise by tax upon the chapters, together with an adjustment of the tax for the several chapters according to their membership. The levy thus made was to take effect only in case the resolution should be accepted by the votes of the chapters to which it was to be referred. To communicate the resolution to the chapters, and to procure their action upon it occupied some time, and the action was not made known in season to allow the revenue for this year to be collected as proposed in the resolution. The old method of collection therefore remained in force for this year, and the resolution having in the mean time been rejected by the chapters, the experiment proposed by the Committee of Inspection and Advice is yet untried.

The other subject proposed by the resolution was the best means of increasing the membership of the Institute, and here your committee find themselves on difficult ground. The attractiveness of membership in any society depends chiefly on two things: the distinction of the members and the work accomplished by the society. It has been the policy of the Institute, as it has been that of all the professional societies that we know of, to ignore the first of these attractions, offering membership to all architects of reasonable capability whose professional practice was honorable, and relying solely on the second. While it might not be practicable or even desirable to attempt any radical change in this policy, which nevertheless has certainly not led to that growth of the Institute which its members have desired, and while your committee are not prepared with any recommendation looking in that direction, it may still be well to bear in mind, what is undoubtedly true, that if the hundred and fifty members of the Institute were all recognized as men of exceptional qualifications, the rest of the profession would be glad to be added to them. If even it could be understood by the public that membership of the Institute was a guaranty of a thorough qualification in the parts of a professional training which are most essential, or if the association could provide any means of furnishing such a guaranty to proper persons in a way that would command recognition, — our influence and prestige would probably be a good deal increased, and the means of advancing our membership would doubtless be in our hands.

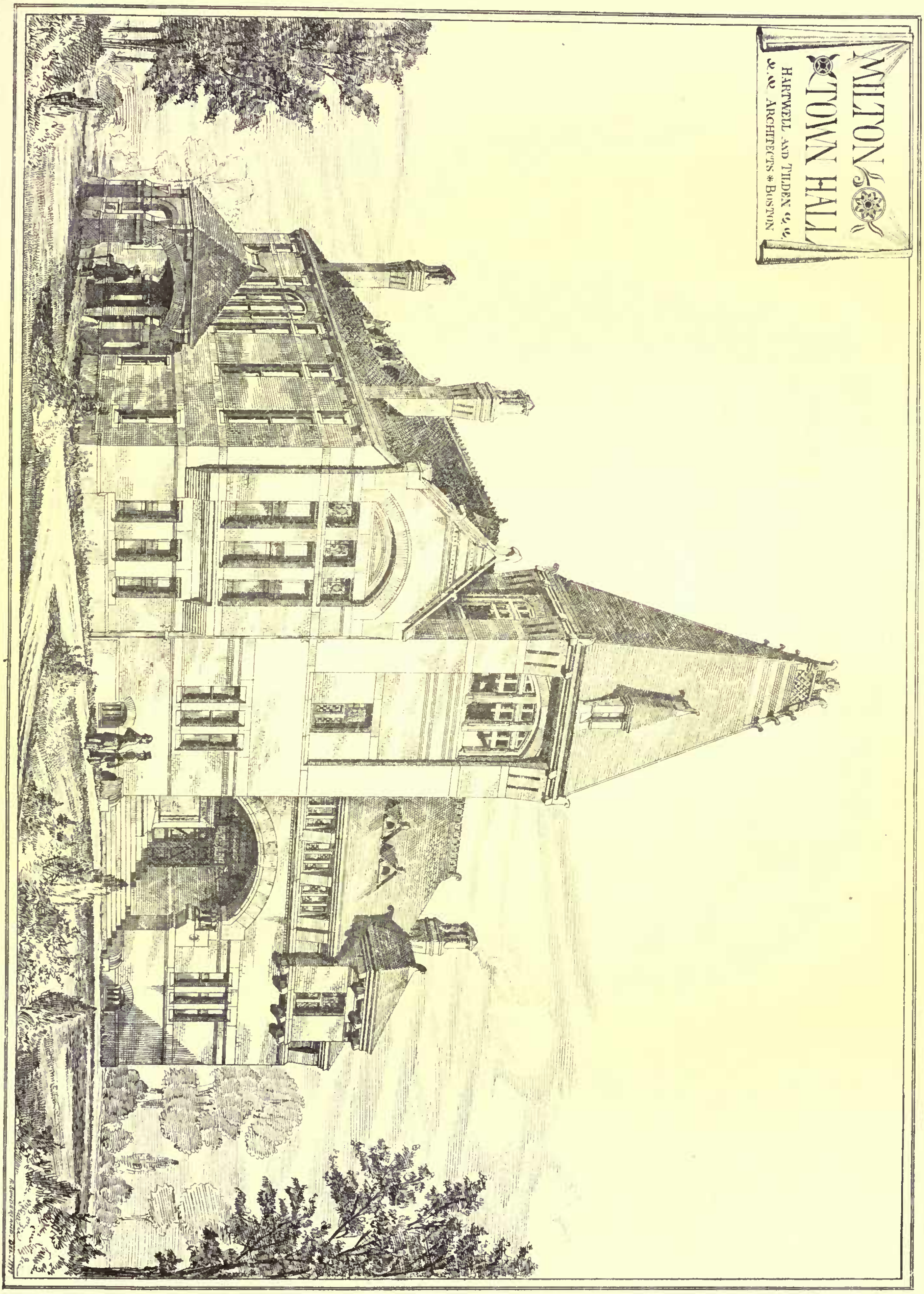
Any guaranty of artistic excellence is, in the nature of things, impossible; natural selection is the only resort here, where the architect's highest qualification is concerned. But another qualification, in which the public are even more interested, and which recent experience has made them look for with especial concern, his knowledge of materials and construction, is fairly subject to a guaranty. Without intruding upon the question of the qualifying of architects, which was by vote of the last convention referred to the Committee on Education, your committee may remind the Institute that the establishment of technical examinations for architects is one of its traditional objects, and may commend it anew to their consideration. Such examinations may be either purely voluntary, as in England, or an absolute qualification for certain privileges, as in some continental countries. They would naturally appeal chiefly to the younger members of the profession, to whom we look for our future membership, and among whom it would be to our advantage to find some means of selecting as well as attracting the more promising. There is reason to believe that there are some among them, at least, to whom the opportunity of proving their qualifications by an accredited examination would be welcome.

As to the interest of the work accomplished by the society, the committee would suggest that here the question of opportuneness may often with advantage take precedence of that of abstract importance, and that it would be an advantage if it were made the special duty of some officer, either one of the present officers, or one especially appointed for the purpose, to study the opportunities of the Institute, to consider what questions are from time to time prominently before our profession or the persons with whom it is concerned, and how they may be brought before it for action and discussion; to find what appropriate subjects have been made matter of special study; to discover and appeal to the men, whether inside the Institute or outside, who have something of value to say to us or are ready to work with us. In the management of the conventions, your committee would suggest that an improvement might be made by taking pains to secure papers from persons who were acknowledged masters of special subjects, irrespective of membership; by announcing the subjects long beforehand, so that there might be opportunity for preparation of discussions; and by taking care that proper time was allowed for them without conflict with the routine business of the conventions. They would renew the suggestion which has been made, they believe, by a previous committee, that at each convention there should be read at least one important paper, carefully prepared by some one whose authority will command general respect and interest, on a subject of technological bearing, constructive or mechanical, and one on some æsthetic or historical topic. They may instance, as one appropriate topic, the whole subject of American archæology, the study of which has, so far as they know, been left entirely to non-professional persons. The efforts that have been made at the last two conventions to procure papers and discussions on matters more or less æsthetic have, they think, added visibly to the interest of the meetings, and illustrated the value of attention given to the more cultivated side of our profession, a side which, in the activity of our business discussions, we are perhaps too apt to overlook. We may here, the committee think, profitably take heed of the example of our English fellow-societies, whose published proceedings are made valuable by careful and scholarly essays on special points in the history of architecture and the arts, or studies of its processes, subjects which are of permanent interest to us all, but for which our active lives leave us little time, and which are not presented to us by the books in a form to be attractive to busy men.

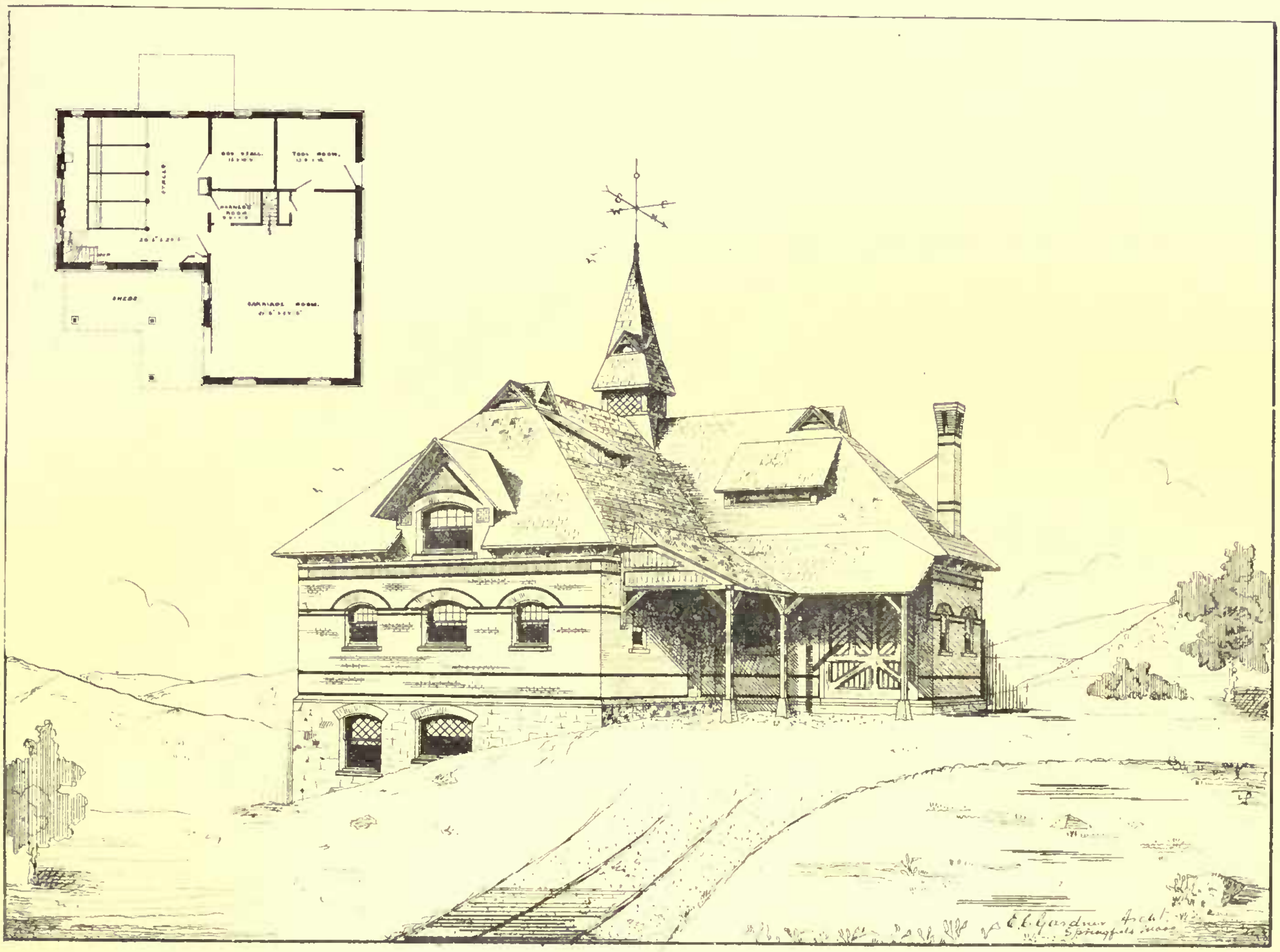
One of the main responsibilities of the Institute is its influence upon the young men of the profession, and with this its future success is intimately connected, since it is to them, as your committee have just reminded you, that we are to look for our future membership. We are not likely to over-rate the advantage to the Institute of leading the best of the coming men to identify their interests with it in the early enthusiasm of their professional career. Nothing so much promotes a common interest as coöperation in work, and we should therefore gain at once in the discharge of our own duties and in the increase of our influence and future opportunities, if we can



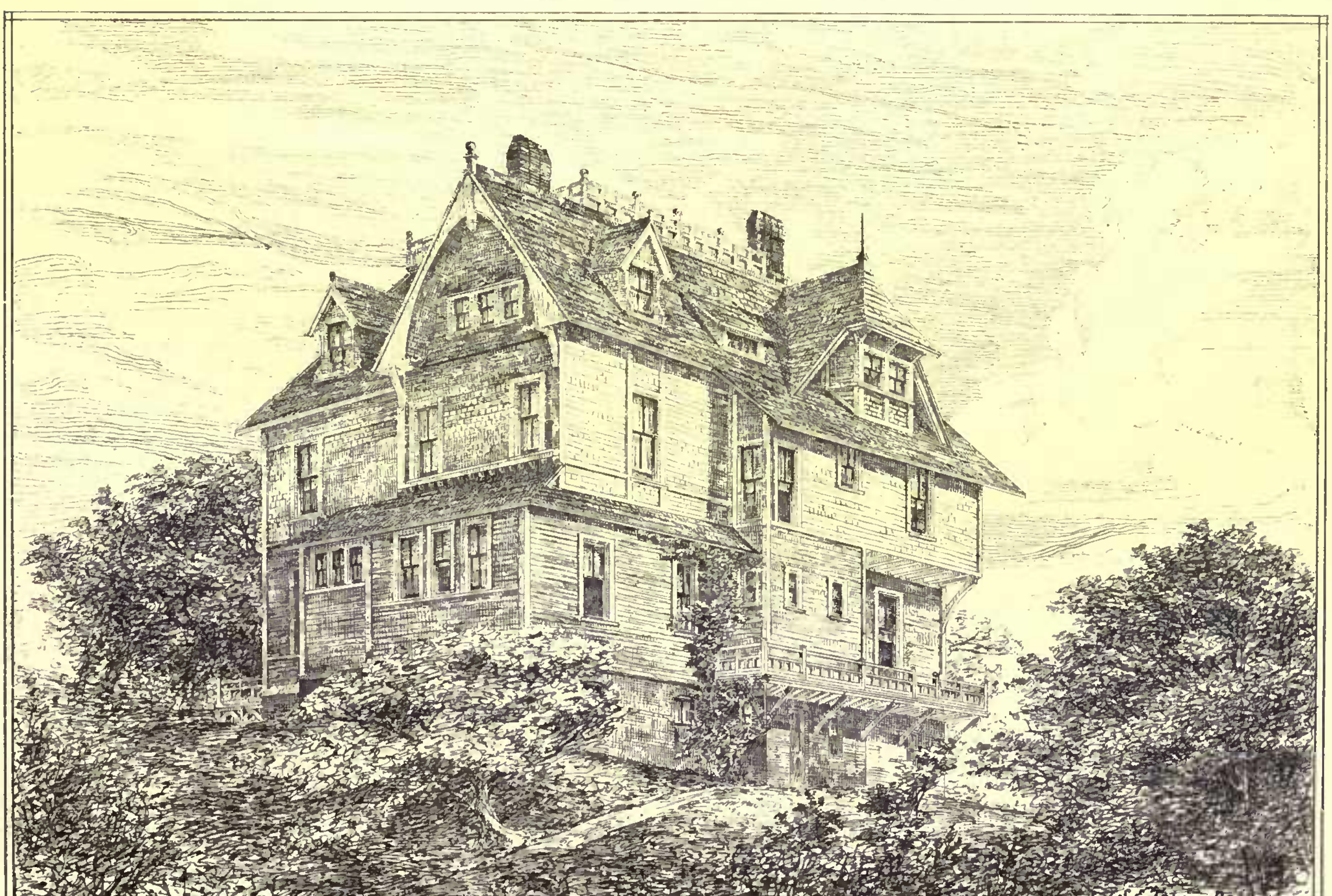
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John A. Fox, Architect.

House, Dorchester Dist.

The Heliotype Printing Co. 220 Devonshire St. Boston

find means of enlisting these younger men in some effective work. There are many subjects of study, more or less neglected, which the young men have time to work out, and which are not beyond their powers if their effort is not too much dispersed; many problems to be studied and records of current experience to be gathered up for which they have time, and the older men have not; much unsifted material which a reasonable amount of well-directed work from them could put into a shape which would make it valuable for ordinary use. We may mention, on the practical side, the collection of information from various current sources concerning new materials which are coming into use; on the scholarly side, there is a good illustration in the expedition of Mr. Clarke for the study of Doric architecture, mentioned in the report of the Boston Chapter this year, and many more modest but useful suggestions can easily be found. If it were understood that the Institute gave a hearty encouragement to promising efforts in these fields, many opportunities for offering such encouragement would doubtless soon appear. And here your committee would remind the Institute of the excellent suggestions contained in the report of the Committee on Education to the last convention.

Among the means that naturally suggest themselves for offering encouragement to our juniors, besides the examinations already suggested, is the giving of a prize or prizes either for excellence in design or for the investigation of special questions of professional interest. A project which has been a traditional aspiration of the Institute, the establishment of scholarships, resident or travelling, will, when it becomes practicable, be a means of great usefulness. With the present slender income of the association, and the pressure for economy which is now felt, the committee do not feel warranted in recommending any specific action which would increase our expenditures; but they seriously commend these suggestions to the attention of the Institute. Respectfully submitted.

H. H. RICHARDSON,
ALFRED STONE,
W. P. P. LONGFELLOW, *Chairman.*

THE ILLUSTRATIONS.

TOWN HALL, MILTON, MASS. MESSRS. HARTWELL AND TILDEN, ARCHITECTS, BOSTON.

THIS building has just been completed according to the design here presented. The natural grade of the site was such as to suggest the arrangement, the westerly side being two stories in height, while the main hall occupies the one-story portion. This is sixty feet square between the bearings of the main roof trusses. The open timber-work of these trusses serves to enrich the design of the ceiling and to favor the acoustic properties of the hall. The small hall is intended to act as a banquet room to the larger one when occasion requires, being connected with the kitchen by a dumb-waiter and speaking-tube. When fairs or other occasions demand the use of both halls together, the windows of separation are thrown up to their full height, and the short flight of portable steps placed in position, as shown by the small sketch of the interior. The smaller room thus forms a raised dais to the main hall. When used for lectures the platform of the main hall is closed off from the rest of the stage by means of the large proscenium screens. These screens travel upon rollers, and when stage room is wanted for school exhibitions, etc., are turned back at right angles to the proscenium wall and secured. In case of theatricals, these screens, folding on themselves, swing around against the back of the proscenium wall, leaving an open stage for the setting of scenery. The exterior walls are of brick laid in black mortar, with the arches, caps, string courses, etc., of Caledonia (N. S.) freestone. A soldiers' memorial tablet of marble occupies a central position under the arch of the main entrance. The appropriation made by the town was $35,000. The building has been erected, furnaces, gas apparatus, and gas fixtures provided, the site graded, trees planted, avenues made, and everything completed within the appropriation.

DETAILS IN TERRA-COTTA.

These details, which were executed by Messrs. A. Hall & Sons of Perth Amboy, N. J., in accordance with designs furnished by different architects, make an interesting showing of the adaptability of the material to decorative purposes, as well as the ability of our American manufacturers. As the designs are the property of the architects, the moulds have doubtless been destroyed.

HOUSE IN DORCHESTER DISTRICT, BOSTON. MR. JOHN A. FOX, ARCHITECT, BOSTON.

This house was designed for Henry N. Sawyer, Esq., to occupy a commanding position on a high hill in the suburbs. The rear or westerly view is the one given.

BARN AT HOLYOKE, MASS. MR. E. C. GARDNER, ARCHITECT, BRIGHTWOOD, MASS.

This barn, which is built of brick, was lately finished for Mr. T. Merrick.

A BOSTON TUNNEL.— The Boston aldermen have appointed a committee to consider the advisability of petitioning the legislature for an act to empower the building of a subaqueous tunnel between East Boston and the city proper.

CORRESPONDENCE.

AMERICAN PAINTINGS AT THE LATE EXHIBITION. — THE MUSEUM OF DECORATIVE ART. — THE OPENING EXHIBITION. — SCENE-PAINTERS AS ARTISTS.

PARIS, January 7, 1879.

AMERICANS abroad have so much discussed our paintings at the Exhibition that it would hardly be worth referring to again, were it not that now personal feelings have somewhat subsided the much criticized selections of the fine art committee can be more fairly judged. No task could be more ungrateful than theirs in view of the immaturity of our art public, which neither has confidence in nor even recognizes its true leaders. The selections of an examining jury are everywhere attended with disappointments, which develop into bitter feelings, violent in proportion to the lack of personal authority in such matters of the members of the committee. A glance at the juries of other countries shows that such authority is made a necessary qualification for the position. Conscientious patriotism may have overruled a shrinking from a duty threatening blows and no thanks, but it is certain the active members of our committee must have ruefully discovered their position was no sinecure. However natural, it is of course unjust that disappointment at our very mediocre exhibition should be wreaked only upon a selecting jury, unless we could know exactly from what they had to choose; but that the exhibitors themselves seem dissatisfied is suggestive, and a protest was actually started among the latter, headed by one whose honorable position on the walls proved his disinterestedness. Such a futile proceeding fortunately fell through.

Putting aside the question why some of our most nationally characteristic painters were not represented, and merely judging from the placing of the pictures, I believe the bias there shown in favor of European influences, to the detriment of that of a more national character, was a serious mistake. Supposing the object of such an exhibition was to render our national art interesting, the mistake was to suppose that our youthful art could, in a collection of *chef-d'œuvres*, the fruits of centuries of mature traditions, exhibit anything but national peculiarities of mind and scene which could be interesting. I am far from depreciating the value to young artists of study with the masters of Europe, nor of deprecating the pride of a pupil when, in his early works, the traces of his master's style are apparent, but it cannot be expected that such works will be interesting in a universal exhibition. Much of this responsibility, no doubt, falls upon the painters, and had they boldly exhibited here landscapes of our wild winter coasts, or western plains, and scenes from negro or Indian life, or even of our honest homely villages, instead of Britton peasants and reminiscences of Europe, the novelty — originality it would seem here — of the subjects would alone have inspired interest and respect. This is proved in the case of Russia notably; for the exhibited such characteristic views of her wintry landscapes and brutal peasant life that, though often so commonplace in composition and *technique* as would have been utterly insignificant in a well-worn French view, these paintings excited much attention here, and were recompensed beyond their real artistic value. The number of our own recompenses shows that the general leniency of foreign critics towards us only proves that they expected nothing of us. In this connection I would recommend to all interested in the art of the Exhibition M. Charles Blanc's recent book upon it, for the veteran critic deals with its different phases with a master's pen. In closing this subject it is a pleasure to testify to the rigid impartiality with which our art committee carried out their views, and the honorable example they gave of resistance to outside influence, oftentimes of necessity at a sacrifice of personal considerations.

The Museum of the Decorative Arts was opened to the public yesterday in the Pavillon de Fore of the Tuileries. The association which has founded this institution is composed of the leading artists and amateurs of France, divided into (1) a committee of patronage, presided over by the Duke d'Audiffret-Pasquier; (2) a committee of thirty directors, chosen for five years, the Duke de Chaulnes, president; (3) the body of founders, who every five years appoint the directors. With this association is now allied the *Société de l'Union Central des Beaux-Arts appliqués à l'Industrie*, whose exhibitions at the Palais de l'Industrie during the last few years were the first movement in favor of the decorative arts. In writing of French furniture I spoke of the uneasiness which intelligent observers could not but feel on seeing unrivalled mechanical skill wasted on the mere repetition of historical examples, and the danger which the absence of new designs and developments threatened to French art in this direction. In the programme of the society this danger is now frankly expressed, and it is acknowledged that in view of the recent efforts made by other countries — among whom America is mentioned — the start the French have had, and their natural good taste, will not suffice to retain their position without vigorous efforts to develop among all classes fresh power and appreciation in the arts, and it is in the encouragement of these that the society is forming collections, libraries, and courses of instruction. The subjects to be taken in hand are divided into two general classes: (1) the external and interior decoration, and (2) the decoration of the person and the objects it employs. These two classes are sub-divided into twelve sections: architecture, sculpture, painting, permanent and movable decorations (such as bronzes, etc.), furniture, glass, pottery and enamels, clothing, personal ornaments, arms, instruction, and libraries; each section is presided over by a member of the committee

of directors, and consists of a varying number of specialists. Each section can appoint new members, subject to ratification from the directors; its proceedings and resolutions must be submitted to the presidents of the other sections, who together form the *Conservatoire* of the Museum, which presents all measures to the directing committee to be decided upon; if accepted the section has entire charge of the execution of such measures. Besides this there is a special committee to organize exhibitions, and class the objects, which will be done, not according to materials, but from an artistic appreciation of their destination. When I add that in all the long list of the committees there is not a name which is not distinguished in the world of art as amateur or artist, it will be understood that this institution promises much, and it will be interesting for us, who are rapidly establishing similar societies, to watch its workings; for, however late it may be to undertake it, the French have the habit of developing to extraordinary perfection such institutions. There is, however, this, peculiarity in the present case that the organization is independent of the government, though the latter has readily furthered it by granting two floors of handsome rooms in the Tuileries.

Of the Exhibition at present it is difficult to write, as the catalogue is not yet ready, and the objects are not labelled. There is a fine collection of lace, and amateurs will be especially interested in a *chef-d'œuvre* from Alençon, which, in the form of a testimonial to M. Dupont Auberville, through whose rare collection of lace many old and lost stitches have been re-discovered, offers, besides the exquisitely wrought arms of the city, a collection of thirty-eight different kinds of modern and ancient stitches with their names. As if a protest against offering again to be copied examples of well-known styles of furniture, there are but few pieces, and those chiefly designed intelligently rather than of remarkable beauty. There is, however, an exquisite grand piano, which refutes the theory that it is too hopelessly ugly in form to be made ornamental. Two kinds of light, highly-polished wood, with pale gilt *appliqué* ornaments serve to set off various-sized panels painted with extraordinary delicacy and sentiment by Gonsalez, the Spanish painter.

A good deal of space is given up to the designs of scene-painters, — cruelest of reproaches to an artist in the opinion of the true American! Ah! If the young genius who is crushed when scoffed at as not being fit to be a "scene-painter" could realize the honor in which the leaders of that profession are held here, he would take courage, and, genius though he be, perhaps condescend to undertake one of the grandest branches of art. Certain it is that the development of modern theatrical representation has opened a splendid field to the true artist, where not only can he display every quality of color and composition of landscape painting on a monumental scale, but people them with magnificent masses of shifting color. Nothing contributed more to the renown of one of Germany's greatest artists, Schenkel, than his designs for opera scenery; and the French set apart in the late Exhibition a special room in the Beaux-Arts section to display a series of miniature stages, with the scenery of well-known dramas and operas, from the theatre of Corneille in 1636, to the more sumptuous settings, beginning with "William Tell" in 1829, down through all the elaborate *mise-en-scène* which has distinguished the French stage, to the unparalleled magnificence of the new opera house. But even here I do not think the merited celebrity is given to the scene-painters. The name of the painter of an interesting picture at the *salon* is on every one's lips, but out of the thousands who are enthusiastic over the beautiful scenery in the theatres — and which alone will often draw full houses — few ask the name of the painter, and beyond the real art-world he is not much known. It would but be fair to have the painter's name upon the play bill; as he always receives his share of attention at the *première*, why not afterwards? Among the foremost of these artists are the two Lavastres, the younger of whom, for his noble scene in the second act of "Don Juan," received the Cross of the Legion of Honor. Chéret received a like distinction for scenes in "Le Roi de Lahore" and other operas, while the elder Lavastre, Carpezat, Daran, and Rubé had *diplômes d'honneur*. All these are men of the highest artistic powers, and deserve to rank with the best painters.

Of interior decoration there are some fine examples. It was interesting to see Charles Lameire's great project for the decoration of a Byzantine church, which raised him suddenly from the position of an obscure draughtsman to be the leading decorator in France. To be sure he is said to have spent eight years upon it, working in his leisure hours, but it is rare that success comes so suddenly and completely. A man of great intelligence, his work is very thoughtful and complete, and with a great mastery over all styles of ornament, he is destined probably to be chief of the new school of decorators which is following the inspiration of Flandrin, and which the sudden interest in all decoration will now bring into notice. Lameire puts much grandeur and majesty of movement into his figures, and depending chiefly upon outline, he at least obtains legitimate decorative effects; but his temperament is not that of a painter, and though a profound student of Flandrin, whose work in St. Vincent de Paul and St. Germain des Pres is matchless, he misses the marvellous modelling which the latter could express in the simplest outlines. Having been charged with the decoration of the Cathedral of Périgueux, he has there attempted to apply somewhat the same scheme which was so successful in his first — and quite imaginary — project, but the result, to judge from the drawings, is not so satisfactory. His decoration of the great hall of the Trocadéro is, however, highly successful, and will add to his reputation. But in the pupil I am forgetting the master. M. Denuelle, with whom Lameire worked, has been for many years the leading decorator in France, and his work in St. Germain des Pres alone entitles him to wide reputation, but he has done an immense deal of good work both in public buildings and dwellings. His manner seems timid beside the bold lines of Lameire, and he appears at his best in refined domestic decoration.

One of the chief interests in the rooms now open is Cabanel's ceiling to the staircase hall, which was finished two years ago, but has not been open to the public. It represents the "Triumph of Flora," and fills a large oval compartment. Though the agreeable form of the oval has been filled with the skill which gives Cabanel few or no contemporary rivals, and the groups are graceful, while of course the drawing is most *serré*, still there seems a mistake in principle, for all the strong tones are at one end of the oval and are graduated off so that the Flora who occupies the centre hardly attracts the eye, while beyond her is a single, light, flying figure to balance at the other end a score of accentuated ones. The result is that the eye does not stay in the picture, a result possibly intended, as the attention is thus forcibly carried beyond into the hall up to which the stairs lead. As the oval is so beautiful a form in itself, and the architect was at pains to adjust it to his square ceiling, this alone seems reason enough to have concentrated the attention within it. R.

AMERICAN INSTITUTE OF ARCHITECTS.

BOSTON CHAPTER.

The regular monthly meeting of this Chapter was held on the evening of February 7.

Mr. J. M. Allen, of New Bedford, was elected a Fellow of the Chapter.

The secretary read a communication from the Boston Art Club, proposing the appointment by this Chapter of a committee to confer with a committee of the Boston Art Club, with the Trustees of the Museum of Fine Arts, and with the permanent committee of the School of Drawing and Painting as to the best means of bringing about a general exhibition of fine arts, to be held in Boston each year. A committee of the Chapter, composed of Messrs. Longfellow, Preston, and the Secretary, were appointed accordingly, with instructions to represent its interests in the proposed conference.

A suggestion of Mr. Ware to pay the extra assessment of the American Institute of Architects, levied upon members of this Chapter, out of the funds of the Chapter, was, on motion of Mr. Thayer, referred to the executive committee, with instructions to report at the next meeting.

After considerable discussion, it was voted that the committee on business prepare a programme for the meetings of the three ensuing months.

By reason of illness, Mr. T. M. Clark was prevented from reading before the meeting his paper entitled "Notes on Contracts."

A DAY WITH M. MEISSONIER.

The mansion which M. Meissionier has constructed on the Boulevard Malesherbes is a plain building, with an extensive frontage to the street. Neither mosaic incrustations nor Moorish arches after the fashion set by Arsène Houssaye, and somewhat overdone in certain new houses, break the uniform wall-surface. The exquisite *ciselure* of the bell-handle may perhaps remind one that it belongs to an artist's door, but the *porte cochère* must be opened before you are struck by the singular character of the building. M. Meissonier conceives art as Mr. Gambier Parry so aptly described it lately, — to him it may have been as easy to be his own architect as to paint a fresh picture. If "the poet, the musician, and the artist are all one in their relation to the world of things and their fellow-men," still more intimate is the connection between the artist painter and the artist architect. They are in Meissonier's case one; and although, perhaps, it seems presumptuous to quote from the example of the greatest genius the world ever produced, we may recall the universality of Michael Angelo's genius, who was politician, engineer, architect, painter, and sculptor, to prove, if proof we need, that if talent only does what it can, genius does what it must.

On the architectural merits of the pleasant home which M. Meissonier designed, and has built, it is not necessary to dwell. A cloistered walk surrounds and conceals the offices and stabling, the latter department, on account of M. Meissonier's intense love of horses, being on a large scale. The *concierge's* lodge is on the right. He admits you, and, if you are unknown to him, will scrutinize your credentials and carefully compare your outward aspect with the orders received. As you ascend the broad flight of steps on the left you are not unlikely to feel as though your absence rather than your presence were desired by the master of the house, supposing it to be your first visit.

Very pleasing is the effect of a double arch, supported by a single pillar at the end of a corridor, of which the windows, veiled by draped material of a soft tone, are latticed. Passing beneath one of the arches, you ascend a wide staircase of oak, having an antique bronze placed here and there along it. The atelier opposite the broad landing is spacious, but remarkable for simplicity. You are now in presence of the great man.

If outward seeming was ever characteristic of a man's nature, it certainly is remarkably the case in the instance of this artist. The active mind of the man, whose life of incessant application is proved not only by the vast number of his works, but by their elaborate finish, is observable in his quick and penetrating glance, and his "sharp, short, and decisive" tone. The somewhat premature whiteness of the hair and beard soften the impression of features, the profile of which is very marked. In presence of M. Meissonier, one feels as in that of a seer gifted with the power of reading one's innermost thoughts. Perfectly conscious of his own magnificent power, he is utterly indifferent to what it may please the world to write or speak of him. His reputation he well knows is world-wide. If he considers the creations of his genius in a commercial point of view, he is well aware that he can command as many thousands for as many square inches of work as he chooses to put on the canvas; and he does not hesitate to make critics feel that opinions, written or uttered, would be equally a matter not only immaterial to him, but perhaps even of contempt. Meissonier is Meissonier, and there is but one such master in the known world.

With the courtesy of a French gentleman, however, M. Meissonier laid down his brush, and pointed out to me the pictures in progress, none of which are intended for exhibition. The work for which his model was standing, it pleased the artist to designate as "*un bon homme.*" It is simply one of those gems of draughtsmanship, rich tone, and exquisite finish, which will make it recognizable as "a Meissonier" wherever it be met. A Venetian man-at-arms standing against the sculptured gate of a palace is waiting for orders; his bronzed features and crisp hair set off by a small cap of black velvet, his short cloak of crimson against the satin lining of which the steel hilt of a sword gleams, the *justaucorps* of pale salmon hue, the trunk hose of dark velvet, the stockings rose silk, and the shoes pointed; altogether a figure such as Titian saw many of, and essentially typical of that age. The bit of canvas on which it was put measures some eight inches by four inches, probably, and will fetch some hundreds of guineas. A more important work, and one conceived in a totally different tone and sense from the majority of M. Meissonier's, was on another easel. This composition is about the size of Metzu's "La Visite." The scene is laid in the music-room of a palace at Venice, the time that of Titian. Nearest to the spectator is standing a woman in white satin, her dress crossed by a sash of pale rose, while her companion accompanies her voice on a monochord laid on the sculptured table before him; clad he is in velvet of the darkest red. The figures are thrown out by the carved panelling and dark hangings of the chamber in which the scene takes place. The contrast of color in the garments of the personages is not more marked than is their expression. The woman's gaze is lost in space, she is wholly absorbed by her art; enthusiasm for the music she interprets fills her soul; while her companion, although the movement of his hands denotes the nervous touch of one who strains every effort to express the rhythm of the air he accompanies, is clearly entranced, not by her music, but by her personal attractions, which it must be admitted are considerable. The story is distinctly given, and marvellous as is the sheen of the satin and delicately fresh as are the rose tints of her scarf, etc., the sentiment of this composition absorbs one's attention more than is usually the case with regard to what we familiarly style "a Meissonier," for there are fewer of those details which excite astonishment from the elaborateness of their rendering, and which, perhaps, in some instances draw the mind from the consideration of the subject in an artistic point of view.

Another canvas, and this one on a still larger scale, occupied an easel: the subject — "Cavalry of the First Republic defiling along a Road through a Wood in Alsace." Their guide, a peasant farmer, quietly smokes his meerschaum while walking between the two dragoons in the immediate foreground. The regiment forms part of the army of the Rhine and Moselle. The uniform is green and yellow; the period 1793. M. Meissonier's thorough acquaintance with the horse was never more displayed than in this picture. Each animal has an idiosyncrasy of its own; the expression of each horse's head differs as essentially as that of their riders. The officer in command is mounted on a thoroughbred, whereas the men ride chargers of a build more resembling that of the Perrichon breed. A critic present involuntarily exclaimed, "*Ces chevaux parlent;*" and I defy any one who studies the heads of the animals in this picture not to understand the remark. "Each," said M. Meissonier, "is a portrait. One is of my own horse, Rivoli. I ride him every day. And here is another picture of him," pointing to a series of studies arranged against the wall. "Ah!" exclaimed M. Meissonier, in reply to a comment on the value of such studies, "in this age rough sketches are the fashion; it takes a man six months to learn to make a sketch, whereas it requires a lifetime to acquire sufficient knowledge to enable a man to finish a picture." Pointing to the troopers, M. Meissonier said, with the pride of a zealous Republican, "That regiment fought at Valmy and Jemmapes." "And," added a bystander, "helped to win the very battle after which your favorite is called (Rivoli), but under the First Emperor." "Pardon," interrupted M. Meissonier, "under Bonaparte, General of the Republic."

Essentially representative of the faultless draughtsmanship, the precision and accuracy of detail, and sharp clearness of atmosphere, which are distinctly among the characteristics of the Meissoniers which fetch fabulous sums, are: "Les deux Amis;" "Petit Poste de la grande Garde;" "Vedette;" "Dictant ses Mémoires;" and "Cuirassiers;" 1805. As the French would say, *ne pas confondre* the latter with the "Charge des Cuirassiers," 1807, for which canvas, measuring 2 metres 50 cent., £12.000 were paid. "Les deux Amis" was first exhibited at the Cercle des Mirlitons, where I saw it three years back. A regiment is drawn up ready to go into action. Two officers, having ridden down the front of their respective corps, chance to meet as they go to take up their positions; they are old friends, have been comrades at St. Cyr; they shake hands, and, perhaps, utter their last "good-bye, old fellow," for the thud of heavy firing and the whirr of flying shells are already on the air. The face of the younger officer is a simple reduction from life, and, as always, the horses he and his friend are mounted on are marvels of exquisite drawing and accurate delineation; the buckles, the straps, the bits, are as distinct as the features of their riders. Nothing is missing, nothing left to chance. Elaborate and typical as is this painting, there is another, if memory serves me, called "La Halte," first seen by me in Mr. Stuart's gallery, Cours la Reine (a perfect treasure house, be it said *en passant*, of Spanish and French modern art), which canvas measures some 24 inches by 18, and for which Mr. Stuart gave some 4,000 guineas, — a fact demonstrating forcibly the power truth has of attraction, when depicted by genius. The subject is not specially interesting; three or four dismounted men are simply halting for an hour's rest in a wood bare of leaves. There is not a grain of sentiment in the scene or subject-matter suggestive of thought. The men are not even fatigued, but the scene is before you, reproduced with exquisite fidelity and a delicacy of handling which defies rivalry. Saddle-bags of the green which is the color of the regiment are still on the back of the bay mare; a gray horse faces the spectator; his rider, in green uniform embroidered with white cord, every twist of which is given, leans against the neck of his charger; he has slipped his arm through the bridle and his fingers play with the horse's mane; he talks idly with him of the bay mare. A few yards off, a comrade, standing behind the bare trunks of the leafless trees, lights a cigar. We see the men, the horses, the trees, the long, dank grass, as though we looked at the scene through the wrong end of a telescope. One expects to see them mount and ride on. "Le petit Poste de la grande Garde" likewise made its first appearance at the Mirlitons some seasons back, and also challenged competition at the Universal Exhibition. To my mind it ranks with the three last mentioned, and has all the distinctive characteristics of M. Meissonier. It is an unpleasant picture to study, for the time of day is early morning, and the season mid-winter. A biting north wind blows across the plain, and snow covers the boulder on which officers and men are looking out for the enemy. The officers keep their cocked hats on with an effort; their horses are held by a couple of orderlies, while they consult together. The very horses shiver; the northerly blast catches the tail of the dark bay and blows it about; one fancies one could count each separate hair; the tail of the white charger is tied up. Their feet are sunk in the snow up to their fetlocks. The sky is gray and snow-laden. The scene is dreary in the extreme, and conveys a feeling of intense discomfort. It has more than once been my lot to examine this picture through a strong magnifying glass. The buckles of the caparisons positively glitter; some details are not visible to the naked eye. It is a miracle of execution, and ought to be looked at, as one would at the wing of a fly, through a microscope.

To prove himself master of his subject, whether that subject be a free lance in morion, buff coat, and trunk hose, or in the last manifestation of Pooleian art, Meissonier exhibits the portrait of his friend and contemporary Alexandre Dumas *père*. The likeness is simply photographic, if I may coin the word, — taken, be it remarked, before that art was invented, for the convenience, but undoubtedly not for the artistic improvement of the human race. Not only is that prolific romancist before us, in the most irreproachable of black coats and the shiniest of polished boots, the red ribbon in his buttonhole, but one sees a likeness I never remarked in the living men, between the father and the son, A. Dumas *fils*. This it probably required M. Meissonier's penetrating glance to discern. — *The Architect.*

THE MONUMENT PROBLEM NOT YET SOLVED.

Keokuk, Iowa, February 6, 1879.

To the Editor of the American Architect:

Dear Sir, — The composition which Mr. Story would substitute for the naked chimney shaft he so properly condemns is very inappropriate and inadequate in many vital respects, the attenuated sham windows, or panellings, apparently piercing the walls, are not calculated to inspire the idea of monumental duration. The four porches and gallery surrounding, as it were, the base seem to detract from it the solidity and stability required for the balance and support of the immense superstructure. The terminal pyramid, with its panelling, is a very unhappy expedient, as placed in the elevation; one can scarcely reconcile the idea of monumental stability with the ungainly perching of an apparently solid stone pyramid on top of a seemingly weak, wire-drawn tower, without adequate base, or die. The pavement or causeway seems not sufficiently raised, nor is the podium sufficiently massive, especially regarding the low-lying site of the monument. On the whole, Mr. Story's architectural effort is not by any means a solution of the important national problem of

an adequate monument to perpetuate to future unnumbered generations the memory of the great founder of this vast Republic, which surely in its second century can produce an appropriate æsthetic embodiment of greatness, stability, and durability, far exceeding Mr. Story's composition

A limited competition should be ordered with the view to call forth the best cultured talent in the country. The judges should be cultured experts. It is evident, from the portion of the monument already built, that durability, stability, solidity, and immensity were the dominant ideas of the monument as originally conceived. In any substitute now adopted it is imperative to give these essentially important ideas full recognition, with added beauty of form.

Giotto's campanile has been, perhaps, too closely followed in its general form by Mr. Story, although his proposed composition is wanting in the redeeming solidity and massiveness, without undue heaviness, of that erection. The spandrel panels over the porch roof perniciously break up the continuity of the base, and trifle with the apparent stability of the composition. Altogether there is a very unhappy combination around this base, while the labored attempts to diversify it in different parts only detract from the stability which its importance demands should be honestly displayed.

Respectfully, ALEX. BLACK.

NOTES OF EXPERIENCE AND INEXPERIENCE.

[INEXPERIENCE.]

3. FURNACE HOT-AIR PIPES. — I trust that when the interesting articles on the Open Fire-Place are finished some one will feel moved to give us a series of equally instructive articles on the furnace, as to the proper management of which both architects and householders alike are too often ignorant. Meanwhile can any one tell me how I can coax hot air to ascend into a small room in a very exposed position in the northwest corner of a house? The only way I can at present accomplish it is by first heating the room with a kerosene stove. If I should attach an Archimedean or a screw-ventilator to the register in the floor would the now slight upward current of hot air be increased by the movement of the screw? HOT AIR.

4. HOW TO PROPORTION CHIMNEY-FLUES. — Can any one tell a young constructor how to proportion his chimney-flues to their use, and how to assure their drawing satisfactorily? TYRO.

5. SAYLOR'S PORTLAND CEMENT. — Can some one tell where Saylor's American Portland cement is made, and by what process? Is there any authentic report of its tensile strength? What parties in Boston receive direct cargoes? so that in case of need we may know where to obtain a quantity *fresh*, and not the remnants of stock of a number of small dealers, hastily collected, and most of it so old as to be worthless. MASON.

[EXPERIENCE.]

FIELD'S FLUSH TANK. — The writer put a Field's Flush Tank in a house which was first occupied in October, 1877. It has, within three weeks, ceased to work, and on being opened was found solidly filled with congealed grease. It may be of interest to some to know the period — fourteen months — during which one has worked perfectly before it required to be cleaned out. The tank was buried four feet under ground, and the clearing out cost about six dollars. C.

NOTES AND CLIPPINGS.

"MACHINERY HALL." — Machinery Hall, on the Centennial Grounds, which originally cost $800,000, was sold at auction on Saturday last. There were only five bidders, and it was purchased by W. C. Allison & Co., car-builders, for $24,000. There is in the building an enormous amount of gas and water pipe, three lines of railroad tracks, about 800,000 pounds of wrought-iron, about 800,000 pounds of cast-iron, about 3,000,000 feet of white pine lumber, about 1,000,000 feet of yellow pine lumber, about 700,000 feet of tin roofing, about 150,000 square feet of glass, about 600,000 perches of stone. The building and all matters connected therewith are to be removed by the purchaser, and the ground on which it now stands is to be smoothly levelled on or before the first of June next. The terms were one fourth cash at the time of sale and the rest within thirty days.

THE BENNINGTON MONUMENT. — The sum of $6,000 has now been pledged to the Bennington Monument fund, in addition to the appropriations from the several States. This has come from all parts of the country, and all but about $400 of it is in sums of $100 and upwards.

HISTORICAL SACRILEGE. — The vicious habit of centralizing objects of artistic interest in museum collections or state capitals, without regard to the rights of history or romantic tradition, has found another illustration in the action of some busybody, corporate or individual, who has transferred to Berlin the famous doors upon which Luther nailed his ninety-five theses at Wittenberg. To be sure, they are not locked up in a museum, but are still to perform their wonted service, being now the doors of the Church of St. Bartholomew; but who of the thousands who may see them in their new position will ever experience a tithe of the feelings which the hundreds have felt who have stood where Luther stood, and there recalled the facts of the early Reformation and the life of the great Reformer? Imagine, if you will, the Falls of Niagara transferred to Versailles, and freshening with their spray the Tapis Vert.

LITHOGRAPHIC STONE. — An extensive deposit of lithographic stone has been found in Estill County, in central Kentucky, which is said to be of sufficient extent to supply the entire demand in this country for years to come. This stone takes as fine a polish, and has been pronounced by lithographers to be in every particular as good, as the best German stone.

STEAM-HEATING. — A Holly Steam-Heating Company has been formed at Troy, N. Y., with a capital of $150,000; work to be begun early in the spring.

PRESERVATION OF HISTORIC MONUMENTS. — In France the following excellent system with regard to objects of historical value prevails: When the Academy of Inscriptions decides that a building or any other object is of national value for historical purposes, the state makes some arrangement for its preservation, either by direct purchase or by the payment of a yearly sum adequate for its care and preservation. In this way the Druidical monuments, so frequent in Normandy, are preserved, under the care of the state, though the territory on which they stand may be owned by individuals. In England such things are left to private enterprise, and those interested in such matters will remember how nearly the interesting monuments at Stonehenge came to being broken up for stone. They would have been had not Sir John Lubbock bought the ground on which they stand.

A COLLECTOR'S LUCKY STROKE AT BRESCIA. — A commission has been instituted by the Italian Minister of Public Instruction, says the *Pall Mall Gazette*, to inquire into the sale of a valuable church altar at Brescia. The altar stood in the Basilica of San Domenico, at Brescia, a church which is now in ruins, and had been handed over to the governors of the hospitals of the town. The hospital funds being low, the governors determined on selling the altar with the decorations of the chapel in which it stood, and found a purchaser in the person of an Englishman, who gave thirty thousand francs for the lot. The altar was chiefly valuable for a balustrade of porphyry, and for statuettes and marbles which adorned it, while the chapel was embellished with marble bas-reliefs of the "Via Crucis." The purchaser, who seems to have known what he was about, promptly disposed of part of his bargain for seventy-five thousand francs, keeping back the bas-reliefs and balustrade, the most valuable portion. Nothing would have been heard of the sale, very likely, but for the large profit made after the first sale, but as it is the Brescians are anxious to prevent any such transactions in the future; and they are the more excited that not long since two objects belonging to the church of the Grazie, one of which had been mounted by Benvenuto Cellini, were sold. The minister has given orders that no more sales of such things are to be made without authority.

AMERICAN ARTISTS. — In connection with the remarks upon American Art as represented at the late French Exhibition, made by our Paris correspondent, the following criticism, which appeared in the last number of the *Portfolio*, may be of interest. Mr. Hamerton, in a "retrospect of 1878," says that no artists have felt the influence of French painters, for good or for evil, more than the Americans. "As represented at the Paris Exhibition they were, with few exceptions, little more than an additional regiment to the great French army of artists. This is the more to be regretted that the Americans are now, as a body, quite sufficiently well educated in art to go on without the help of foreign instruction. There ought, of course, to be good public galleries in America, but with those, and a sound system of instruction in the United States themselves, it is probable that a really original American school would very soon form itself and gain a fresh strength of its own quite independently of Europe."

A BURIED ETRUSCAN CITY TO BE LAID BARE. — The site of the ancient Tarquinia is owned by the Hospital of Santo Spirito, which has rented it to a company of twelve capitalists. These make the excavations, which yield good results, but are not as carefully made as they should be. The Archæological Commission therefore has prescribed the rules to be used in excavating in order to lose nothing of the benefits that could be derived from so interesting a spot. If their orders are obeyed, Tarquinia will be laid open to the day in the same manner as Pompeii, and a visit there will be not less interesting. Indeed, when the walls and the foundations of the houses, the pictured tombs, and the ancient streets shall be well defined, the interest will be even greater. The entire plan of the city, three thousand years old, will be revealed, and standing on that now silent and beautiful elevated plain one can imagine the busy life and the opulence and poverty that were there in the ancient days. The tombs are on a hill at some distance from the site of Tarquinia, and are so many that new ones are constantly discovered. When I was there I stood where men were excavating and saw, several feet below the surface, a hole about two feet square. We heard a sepulchral voice that one could have imagined to belong to its ancient occupant, and saw the man who had gone down to explore the tomb hand out a dry skull. These skulls are all carefully marked and sent to the craniologists, who prize them highly. Not all of the tombs are painted, but those which are are provided with an iron grating and a lock and key, and are shown by the keeper, who lives in Corneto. Many of these interesting frescoes are injured by the humidity, and some have disappeared. Copies of them may be seen in one of the rooms of the Etruscan Museum of the Vatican. — *Letter to the Evening Post.*

SOME REASONS WHY CHIMNEYS SMOKE. — A correspondent of the *American Builder* says that the following are a few of the causes of smoky chimneys: Want of sufficient height in the flue. The outlet of the chimney being placed in a cold and exposed situation, while the air with which the fire is supplied is drawn from a warmer and more sheltered region. Excessive width in the flue, by which a large volume of cold air is drawn in and allowed to lower the temperature of the ascending column. Low temperature of the interior of the flue, in comparison with that of the external air. Humidity of the air. Too accurate fitting of the windows and doors, and joints in the flooring. The draught of one fire injuring that of others in the same house. A current caused by the heat of the fire circulating in the room. A flue of insufficient size. A foul flue. Displacement of masonry, or accumulation of mortar within the flue. The sudden obstruction of the draught by gusts of wind entering the chimney-top. Increase of density of the air at the chimney-top, due to the effect of wind in rising from the eaves of roofs. Draughts within the room, which throw the smoke out of the influence of the ascending chimney current. Too much smoke area at top of flue. Location of building in some position where there are cross currents of wind. There are many other causes which, alone or combined with others, prevent chimneys from "drawing," but you will probably find the reason of your chimney not drawing as it should, among the foregoing.

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THE long discussions and the labors of a special commission on the question of the Congressional Library have led to nothing more definite than a recommitment of the matter to the Committee on the Library, "with instructions to report a bill providing for a commission of skilled persons to examine and report to Congress, at the next session, touching practicable changes which may be made in the Capitol building, adapted to the accommodation of the two houses of Congress and the library." This leaves the vexed questions as far from solution as ever, with only the contribution of a certain amount of Congressional debate. It will be disappointing to those who have looked with apprehension at the prospect of seeing the Capitol turned over into new hands for alteration, to find that the carefully considered recommendation of the last commission has been set aside, and, as shown by the resolution and the debates upon it, that the prevailing inclination, in the Senate at least, is still in favor of keeping the library in the Capitol, and of increasing the building so as to make room for it.

IT is entirely natural that Congressmen should resist the idea of putting out of their own reach the library which they have collected with care and to which they are accustomed to refer constantly. But the truth is, that the library has long outgrown, not only the space provided for it, but the Congress for which it was itself provided. This was the necessary result of the provision which has been made for its increase, provision that was proper for a complete national library, such as it is desirable on many accounts to have, but to a Congressional library superfluous, and even, as the result shows, embarrassing. Exception was taken, in the course of debate, to the idea of maintaining a national library, or two libraries; but the actual fact, which seemed to escape notice of the Senators, is, that there are already two, and must inevitably be two, to all practical intents, under the system that is in use. That is to say, there is a certain number of books to which Congressmen resort for reference, which they must have at hand; and there is a much larger number for which they have no use, — which, as Congressmen, they practically never see and need never concern themselves about. Moreover, a great part, at any rate, of the smaller number are duplicated in the larger, we understand. This larger number forms a library which is extremely valuable, and invites a great variety of uses. So long as it is in the Capitol it is less accessible for those uses than if it were properly housed by itself, is less secure, and is absolutely in the way in a building which ought to be reserved for legislative needs. It is a general library, — national, let us say, if there is any virtue in the word, inasmuch as it is intended to contain the sum of American literature, — and cannot in reality be anything else, whatever we may call it. A Congressional Library should by all means be in the building where Congress meets, and it is better, we should say, that it should be kept for the exclusive use of Congress; so that there may be no interference from the demands upon it by persons outside. But since space is valuable and bulk inconvenient, it should not include a mass of books for which Congress has no need. If fifty or seventy thousand volumes are enough for all the uses of Congress, as we are told by the librarian, Mr. Spofford, who probably knows more of this than any one else, the other three hundred thousand are better rejected, and put where they are more valuable than they are in its library. A working library of two million volumes for a legislative body, such as there is now talk of providing for, is an absurdity. When Congress began collecting books, two courses were open to it. One was to provide such a limited collection as would best serve its own needs, the other to make its collection as complete as only one supported by the resources of the general government could be, one therefore whose only excuse for existence would be its general uses. Congress has long ago committed itself to the second alternative, and it is as well to recognize the logical conclusion to which it leads.

As concerns the question of architecture, the arguments seem to be on the same side. A number of propositions for enlarging the Capitol to hold the books have been brought forward. There is no doubt that in some way the building can be so adapted as to make room for the library as it is or will be for a few years to come. There is no more doubt that to make it a permanent nursery for a child of such gigantic powers of growth is impracticable. Every few years the same difficulty would recur; the inevitable result would be the conclusion, when the house had been spoiled, that after all father and child could not live in it together. Irrespective of space, a legislative body and a large public library should not try to live together. Each ought to have the supreme control and the sole possession of its building, and they require buildings of different kinds. The person whose judgment in regard to alterations of the Capitol is before all others entitled to respect is the architect who gave it its present form, Mr. Walter. His judgment, quoted in the debate, was that to extend the central fronts of the building beyond the twenty-five or thirty feet which he recommended and intended when he added the wings would be disastrous to its design. Such an increase as this would give but short relief, and it is not easy to believe that the more violent alterations which are proposed would be architecturally satisfactory. Mr. Conkling exhibited in the course of the debate a design which, he said, imitated the advancing porticoes in front of St. Peter's at Rome, two extensions being added to the wings of the Capitol at a lower grade on the descending ground at the west. To criticise a design without having seen it is dangerous; but we should think from Mr. Conkling's description, so far as we understand it, that the likeness to St. Peter's must be more in fancy than in reality; while on the other hand most architects are agreed that the things which among the many additions that disfigure Michael Angelo's original conception, and do most discredit to it, are these very porticoes, added by a man who seemed to make it his mission to degrade the work of his predecessors, the mischievous Bernini.

THE interest which has been aroused by the competition of designs for a model tenement-house, set on foot by our enterprising fellow journal, *The Plumber*, and certain gentlemen of New York, bears witness, not only to the judgment of its projectors, but to the importance of the subject and the attention it is receiving from many classes of persons; also, perhaps, to the freedom from the oppressions of business which has encouraged so many architects to give their time to it. Our New York correspondent has given an account of the competition in another column, to which we refer our readers for detailed information. Nearly two hundred designs have been sent in, from thirty different towns, ranging from London to San Francisco, to testify to the interest with which architects have received the competition; and the crowds of visitors who have come to the Leavitt Art Rooms to examine them show how much attention it has attracted from the public. The conditions of the problem were made, designedly perhaps, the most unpromising possible, the building being required to fit a New York city lot of twenty-five by one hundred feet, surrounded by other buildings on all sides but the narrow street front. It was to be of brick, with wooden floors and a fire-proof stairway. Five hundred dollars were assigned in premiums for the best plans, which had necessarily to be studied with an eye to the most profitable use of the land and building, as well as to the comfort and sanitary condition of the tenants. A committee of award has been chosen, in whose judgment and equity everybody will have confidence. They are Messrs. R. G. Hatfield, architect, the Rev. Drs. Hall and Potter, Prof. C. F. Chandler, and Mr. Rob-

ert Hoe; their decision, which at the time when we write is yet to be given, will make chief account of security against fire, lighting and ventilation, plumbing and drainage, seclusion and accessibility of rooms, convenience and economy of plan. The tenement-house question has become so urgent to the people of New York that the most prominent of their clergy have agreed to set apart the twenty-third of this month for a general appeal to their congregations in its behalf.

THE prime condition of the plans, which as we have said is the worst possible, is simply this well-known condition of the typical New York house-lot, with only oue narrow end open to light and air. This manner of dividing land, which allows of shredding it up into the smallest practicable parcels for individual use, is made to answer for separate dwelling-houses, where the rooms are but three or four on a floor, and where a considerable yard-room is welcomed. But no division could be more utterly hostile to tenement-houses, in which the floors are to be subdivided into many rooms, each of which should have its direct light and air. In using such lots for such building, the owner is driven to choose between covering them with rooms which are dark and unventilated, or giving up a considerable part of his land for the sake of letting light and air into the rest. To make the most successful compromise between these two evils was of course the first point in the problem offered for this competition. It was doubtless offered as the extreme case which comes up to investors for practical solution, and that which therefore would most interest the men who are likely to build tenement-houses. The New York system of division is very wasteful when applied to such uses. Manifestly that lot is best adapted to great subdivision of plan which has the most frontage in proportion to its area; and it would probably be found profitable to pay more for land with more frontage, just as the thrifty carpenter finds that lumber most economical of which least goes to waste. The city of New York, like all our modern cities, was laid out only with a view to the owners of individual houses. The experience of older cities, which have taken their form by a natural instead of an artificial process, shows that the most economical arrangement for housing people compactly is one of narrow streets very near together. The drawings sent in for the New York competition may be of use whether the experiment succeeds or fails. If they show that a convenient, wholesome, and economonomical tenement-house can be built on the ordinary New York lot, we may look to see houses of this kind built; if they show that it is not likely to be done, we may hope that people will take advantage of the lesson to improve their awkward system of division.

WE have spoken once before of the rather singular suit which the ex-Empress of the French and the former Prince Imperial, as heirs of Napoleon III., have lately been carrying on against the French government for recovery of the Imperial collections at Pierrefonds and Fontainebleau. These collections were formed by the Emperor, and shortly after his death a claim for them was submitted to the government. The claim was at first allowed as a matter of course, and the collections were assigned to the heirs by the executive, together with a large indemnity for damage to other private property of the imperial family. The Assembly, however, modified the decision of the ministry, and declared the museums state property, allowing the heirs the diminished indemnity of eight hundred thousand francs. This amount was afterwards increased, but the Empress refused to accept the order of the Assembly, and appealed to the law. The courts have just decided against the title of the imperial family, and the collections will henceforth be considered the property of the French nation. They are collections of peculiar value and interest. That at Fontainebleau was a splendid accumulation of Chinese valuables, bronzes, *cloisonné* work, carvings, and jewels, the French share of the booty taken when the Chinese Emperor's famous summer palace was sacked by the combined English and French expedition in 1860. That at Pierrefonds is a very remarkable collection of ancient arms and armor, of which various illustrations are to be found in M. Viollet-le-Duc's "Dictionnaire du Mobilier Français." A great part of it was the noted Sollikoff collection, which the Emperor had bought, and had increased till it was valued at a million and a half of francs. Apart from the rights and wrongs of the question, it will probably be a satisfaction to most persons who are interested in these collections to know that they will remain in the care of a nation that may be trusted to preserve them, instead of reverting to private hands, out of which they would run great risk of being scattered.

THE grounds on which the suit was argued and decided are curious enough to interest other persons than lawyers. The Fontainebleau collection had been claimed as the private property of the Emperor, because he had purchased it out of the "civil list," which was his own allowance, and though the claim, as we have seen, was at first allowed, when it came to the scrutiny of the courts, it was recalled that one of the earliest acts of the Emperor's reign, passed in 1852, had declared that all objects of art which should be placed in the Imperial residences, whether at public expense or not, should become the property of the state. This act had been passed to estop similar reclamations from the family of the deposed Louis Philippe, and thus the Imperial family found itself hoist by its own petard. An attempt was made to evade the act by the rather amusing plea that the Chinese valuables were not objects of art, but only curiosities, a plea which was very naturally rejected. The collection at Pierrefonds, on the other hand, was claimed on the ground that it had not been placed in an imperial house; because, it was argued, the castle of Pierrefonds, which has been restored from a mere ruin by M. Viollet-le-Duc, to his great glory and its own, was rebuilt by the Emperor from his privy purse, and was therefore not an imperial residence, but his private property, although it stood within the state domain of Compiègne,—a plea which, like the other, was overruled.

YOUNG ARCHITECTS.

PROFESSIONAL STUDY.

ANY one who compared the work of the average European architect—French, English, or German, for instance—with that of his American fellow, would be likely to find that it differed from the other by a certain air of homogeneity which independently of its other qualities would make it look like the work of the more skilful hand. The homogeneity might be far from perfect; the work might be commonplace and uninteresting, or might show more striking faults, but it would be apt to have after all a more consistent character than the other. There would probably be a look of *savoir faire* against which the American work would stand out with a look that would suggest inferiority, even if there went with it, as there very naturally might, an expression of enterprising vivacity which the other lacked. The difference is mainly in the power of adjustment, the sense of fitness and coherence that comes of deliberate and careful study. It means simply skill,—the technical skill of men who have thoroughly learned their business. In other words, the work of the European architect shows that in general he knows his business better than his American fellow, and the difference appears in characteristics which to the architect show the crowning qualities of his work. If we looked a little further into detail we should be likely to find a narrow range of forms, perhaps also a certain crudeness in the forms used, as if the designer were rather poorly equipped. Both these characteristics—a want of *ensemble* in design, a want of knowledge and refinement in detail—would be likely to impress themselves on the educated foreign architect who should visit this country. He would be likely to set them down as indications of want of familiarity with the things which educated architects are expected to know, and to infer that American architects, as a rule, were not well read in their profession.

In this he would not be so far from the truth as we could wish. Our young men in their student days pick up what they learn, with little effort at education and no system. Those who attend the architectural schools do better in this respect, and the advantage of it shows in their training; but the habit of our people hurries them through their preparation so that the schools are not allowed to extend their drill beyond what is barely necessary to set pupils on their feet. The student finishes his two years of regulated study, and then goes into an office, where all his time and attention are taken up with routine work. Henceforth all his training is in making the drawings he is told to make, watching the work of his master and fellow draughtsmen, and looking over from time to time an architectural periodical or a portfolio of prints and photographs, for amusement's sake, or to pick out here and there a few "motives" and details to press into service in his drawings. Anything like serious study, except in the limited range of the work he is carrying out under direction, is difficult, and practically is not accomplished. The usual result is that the young architects who go out into

practice, as they usually do after two or three years' work in an office, and offer themselves for all the work of a fully equipped architect, have really no equipment but that which the routine of the office work has furnished them, know nothing but what they have learned from the designs which it has been their fortune to work upon, or what they have picked up by observation of those who worked at their elbows.

How slender this stock in trade is apt to be is shown when the young architect gets to work for himself. A few details or tricks of hand learned from the master with whom he has studied, and the architectural common places of his day and neighborhood, accepted without discrimination for want of choice, are his outfit. Practice and natural cleverness have perhaps given him a sort of facility in handling his small stock of forms; and he designs such work of the ordinary kind as falls to him, usually ordinary houses in the country or city, with ease and without discredit as compared with his fellows. He is active-minded and enterprising, however, with a faculty of adaptation which with good training and a fair range of study would have served him in good stead, and with a great readiness to catch at anything that comes in his way, and press it into the service of his work. He is inventive, too, and his architectural work is seldom without some characteristics of its own. When he has definite wants to guide him he is not at a loss; no planning is fuller of ingenious contrivance than that of American buildings, particularly that of dwellings and other buildings whose requirements are well defined and understood.

If this readiness of mind were borne out by a due professional cultivation, our architecture would hold its own very well with the architecture of other nations. We might not have what those desire who clamor for a national architecture, if they desire anything definite; but we should have architecture that would be well studied, homogeneous, and refined, as well as spirited and ingenious; neither trivial, nor coarse, nor fantastic. What are the actual faults of our architecture we have declared too many times to repeat here. If we were to characterize its shortcomings in the most general and concise way, we should say that American architecture was on the whole illiterate. It shocks an educated eye by faults which are not the marks of incapacity, — nor only of haste and want of care, though there are enough of these, — but indications that its authors have not learned their business as designers. Of course there are many exceptions to this, much work that shows both skill and knowledge. But a great part of our architecture, even that of those who set their aim much above the pure vernacular, is visibly the work of men whose eyes are not well trained to niceties of form and proportion, whose minds are but slenderly furnished with material, and who have not learned how to properly select and apply among their small store of forms those that suit their occasion. A very narrow range of work is enough to exhaust all their stock of acquirements, and when they go outside of it they are apt to fall away disastrously from their own standard.

We see this failure conspicuously when our architects are called upon for something outside their ordinary manner of work. One is now and then startled, for instance, to see how this or that architect, who has perhaps a clever knack of designing picturesque country houses, fails helplessly when he essays a civic building that calls for some state and elegance; or how another, of greater fame, who has helped to line his city streets with imposing warehouses and shops, sinks under the burden if his confiding clients charge him with the building of a church. We see it more conspicuously when it comes to the design of purely monumental structures, in which the warmest of considerate patriots has never accused us of much success. If there is no country in the world whose monuments are on the whole so bad as ours, this is due first of all, no doubt, to the fact that so many of them are designed by men who are not architects at all; but also to the other fact that so few of the architects themselves have been trained to a skill in design which will carry them safely through when they are left to their own fancy and power of composition, with no practical needs to show them which way to go, none of the habitual conditions of their work to prevent their running into extravagances. We see it again in the poor results when buildings of unusual importance are put into competition. The proportion of men who are sufficiently trained to deal creditably with unusual designs is not enough to answer to the call of such competitions, which are for the most part not so arranged as to be attractive to them, though they do attract the average practitioner, and still more the inferior one. The gross result is a very small proportion of really good work, but an immense array of mediocrity and rubbish; and yet it is in answer not to a demand for an exhibit of ordinary work, but to a system especially contrived to call out for important occasions the best that can be had.

The thing which in architecture, as in any other pursuit, fits a man for an emergency, or for anything beyond the habitual call upon his powers, is the permanent equipment of his mind. The same cultivation which will give excellence and variety to his ordinary work is more imperatively necessary when he wishes, as all architects do wish, to meet the unusual and exacting problems that will present themselves from time to time. This is especially necessary to a man whose work is mental production which, like an architect's, must be done "on time," and usually on a small allowance of it. Cramming from prints and photographs meets the case but poorly. It is not that which he seizes on at the moment that will serve him for a special effort, except so far as it finds its place in a mind already well furnished. The teaching of his practical routine falls short when he is called aside to do unusual work; hence the uncomfortable air of not knowing what to do, or why to do it, which marks the extraordinary efforts of men of narrow experience. The man who comes up to the occasion is he who takes care to keep his mind stored with more material than he needs for his daily use, and in such order that he feels at once and instinctively what of it can be used together, and for what it will serve; or the man who has ready in his mind distinct and well arranged conceptions, which he has not used, but is waiting an opportunity to carry out. As may be supposed, these two men are commonly the same: the means by which they equip themselves is careful study beyond their daily necessities. The mere everyday work of such men has the same preëminence as their occasional work. They are the men who give shape and movement to the architecture of their generation, who lead the way where others follow, in small things as well as in great.

To consider the reasons of the neglect of study, which certainly is characteristic of American architects as a class, would lead us too far. There are probably many of them: perhaps the most influential is the lack of any tradition of architectural education, and the consequent fewness of those who attend the professional schools. This is increased by, and itself increases, the haste of young architects to get into practice. It is of no use to say that we lack the means of study. Other nations may be more favored in these than we; but we have enough to greatly improve our condition. We have schools; books and illustrations without number are within reach of most of those who will use them. The trouble is rather that we do not use the means we have. There are probably few architects among us who know much of the literature of their profession; not a great many who have any such impression of style or of harmony as would keep them, not merely from grammatical solecisms, which are in themselves of small account, but from such discordance of detail as would offend a sensitive eye if historical styles had never been known. The young men lack the right kind of ambition; when they get older they are too busy, or else are confirmed in negligence. There is, to be sure, a good deal of cursory glancing at photographs and architectural illustrations, collecting hasty and ill-ordered impressions. One hears occasionally the disparaging remark: "Oh, these things are all in the books," as if they were therefore superfluous; but the books are not read. A good many imported books and reprints are sold in the country, but it is only the plates in them that get any attention. The text, however valuable, finds hardly any readers. The few architectural books that are published here find little sale if they are good for anything in the way of study. As for plates or photographs, there is little idea of any careful comparative study of them, such as is necessary to make them valuable. On the contrary, the more miscellaneous the collection, the better its sale. It is not surprising, in view of this habit, that the tendency of our architecture should be toward the fantastic. It sometimes tempts us to wish that such means of education were fewer among us, rather than more. If there is any nation which needs especially to chasten its architecture by reserve and diligent study, it is one that has no traditions and no style of its own, but depends entirely upon eclecticism. That under such an unpromising system — or rather want of system — we can show so much progress in architecture as we have made in the last ten years, inclines one to believe that we must have some special aptitude for it; but our further progress is likely to be slow unless we can steady ourselves by some habits of solid study.

THE OPEN FIRE-PLACE. VII.

SMOKE-CONSUMING FIRE-PLACES. II.

Fig. 41 represents another smoke-consuming apparatus, similar in principle to the preceding, but placed against the wall like an ordinary fire-place. To establish a draught it is necessary to burn some kindlings within the little door placed above the grate before lighting the fuel in the latter. This form of fire-place is objectionable, on account of its liability to smoke upon slight provocation.

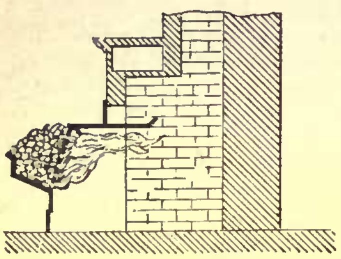


Fig. 41. From Peclet.

Mr. Touet-Chamber attempted to overcome this objection by placing the grate in a niche, as in Figs. 42 and 43, and having two openings into the flue, one above, as in the ordinary fire-place, to use when the fire is first lighted, and one below to reverse the flame.

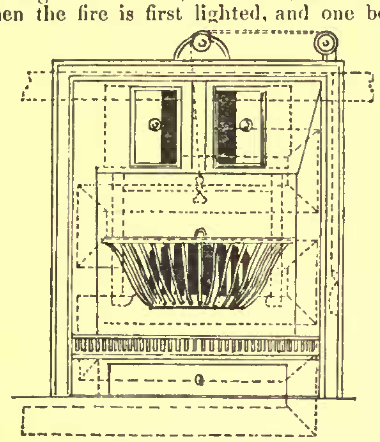


Fig. 42. From Peclet.

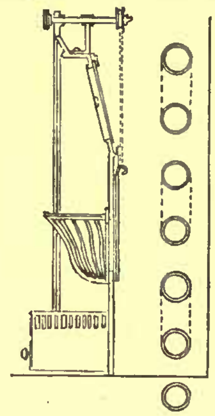


Fig. 43. From Peclet.

He added the tubes behind the fire-back to save the heat of the smoke and flame, by warming in them fresh air from the outside. The position of the upper openings, however, is such that their presence is far from being an infallible cure to smoking, and the objectionable appearance of the fire-place, when partially blackened by smoke, can easily be imagined.

These objections may be removed by certain modifications hereafter to be shown. Franklin accomplished the same result, of consuming the smoke, in a different manner. Instead of reversing the flame, he reversed the grate. The device is shown in Fig. 44. The grate is cylindrical in form and revolves upon a fixed seat. The fresh fuel is thrown in through the door, represented in the figure as opened and supporting a pitcher. This door is opened for the purpose by means of a poker. The door is then closed, and the grate revolved by means of the poker, so as to bring the fresh coals underneath those already burning. By this means the smoke of the fresh fuel is obliged to pass through the fire or red-hot coals, and is ignited.

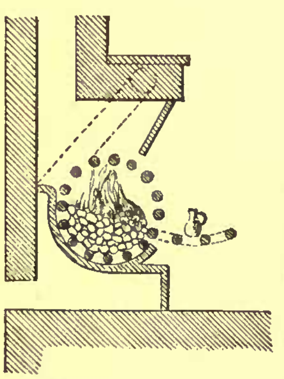


Fig. 44. Franklin's Smoke-consuming Grate. From Labarthe.

In 1815, a Mr. Cuttler took out a patent for a smoke-consuming grate, with a chamber or magazine attached, for containing sufficient fuel to last all day. Fig. 45. The following description is from Rees's "Cyclopedia:" "The bottom plate of the chamber is movable, and, by means of a wheel and axle, the fuel contained in the chamber can be raised so as to bring a portion of it into the grate at the lower part or from beneath, and thus from time to time replace the fuel that is consumed without the trouble of throwing on coals. To make the fuel burn, the flue must be so constructed as to produce a strong draught through and across the top of the fire. Introducing the fresh coals from beneath causes the smoke therefrom to be consumed in passing through the superposed hot coals. Another improvement is to reduce or extinguish the fire; the fire is lowered into the chamber beneath the grate, and is thus deprived of a supply of fresh air, and is consequently soon extinguished." If by this means the smoke could be entirely consumed, soot and chimney sweeping would be unknown, and smoke could not enter the room because it would cease to exist, and a fire so readily extinguished would be a great source of comfort to the anxious housekeeper.

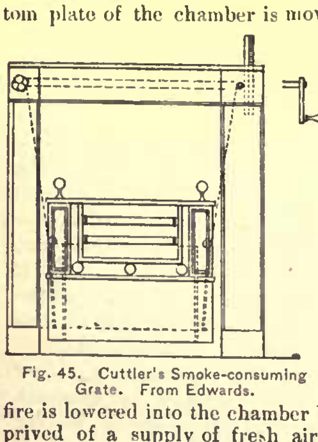


Fig. 45. Cuttler's Smoke-consuming Grate. From Edwards.

Dr. Arnott effected the same object by a somewhat simpler means in his "Smokeless Fire-Place." Fig. 46. His coal chamber has, like Cuttler's, a false bottom or piston supported by a piston rod with notches, in which a catch engages so as to support the piston at any required height. By placing the poker in one of these notches, and resting its point on some fixed support, it may be used as a lever for raising the piston, and bringing a fresh supply of fuel into the grate. Should it be necessary to replenish the coal-box, while the fire is burning, as when the piston has been raised to its full height, a shovel or spade, which may be made for the purpose, is pushed in over the piston to take its place, while the piston is lowered. The spade is then raised in front by its handle, presses upwards the two front bars of the grate, which bars are arranged loose for the purpose, and exposes the mouth of the coal-box, and a new charge of coal is shot in. It is, of course, important that the piston should fit accurately in the coal-box to prevent ingress of air from below, or in other words to limit the combustion to that part of the fire which is visible from the room. In recommending this device, Dr. Arnott stated that the cost of washing the clothes of the inhabitants of London was greater by two and a half million pounds sterling a year than for the same number of families resident in the country, to say nothing of the injury of such articles as carpets, curtains, female apparel, books and paintings, decorations of walls and ceilings, and even the stones and bricks of the houses themselves, from the same cause. He also urged that the frequent washing of hands and face led to an increased consumption of soap; and that many trees and shrubs could not live in a smoky atmosphere like that of London.

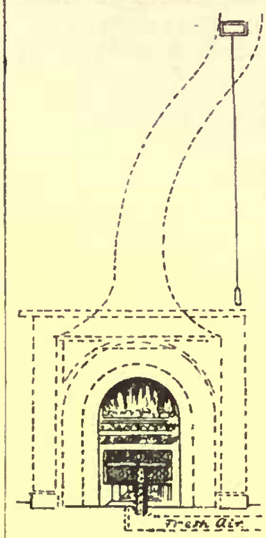
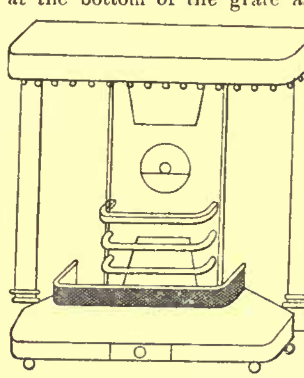


Fig. 46. Dr. Arnott's Smokeless Fire-Place.

Nevertheless the complete combustion of the smoke will not render it wholesome to breathe. Some injury is no doubt caused by inhaling soot; but by passing the smoke through the fire in some smoke-consuming apparatus, while we save the heat, we convert the visible soot into invisible acids, carbonic, sulphurous, and pyroligneous, and ammonia, etc., of which, with water, it is composed.

Figs. 47 and 48 represent the smoke-consuming grate of Atkins and Marriot, an ingenious contrivance, which introduced fresh coal at the bottom of the grate as it was wanted. The section shows



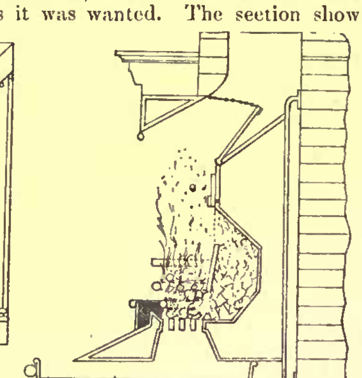
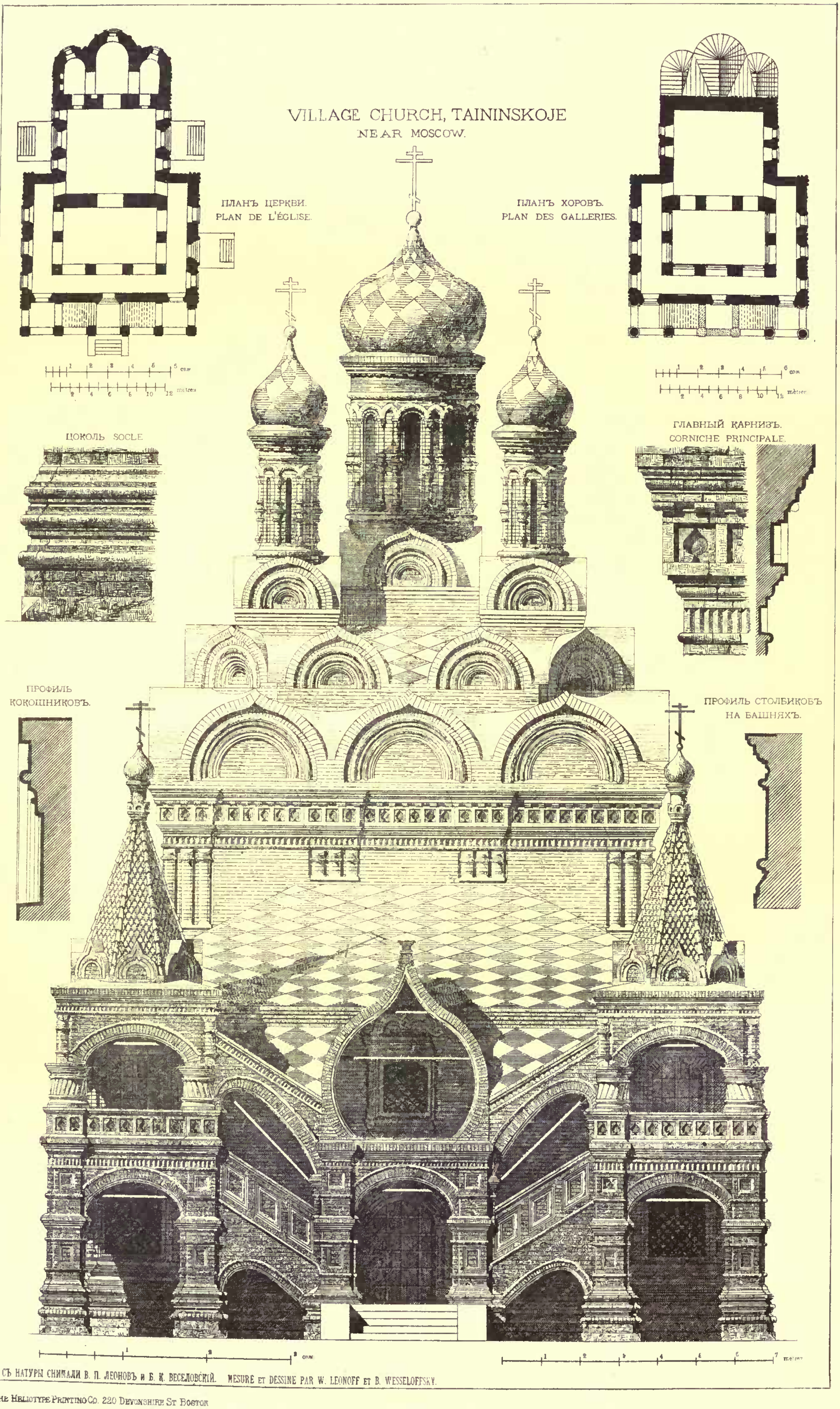


Fig. 47. Atkins & Marriot's Smoke-consuming Grate. From Edwards. Fig. 48.

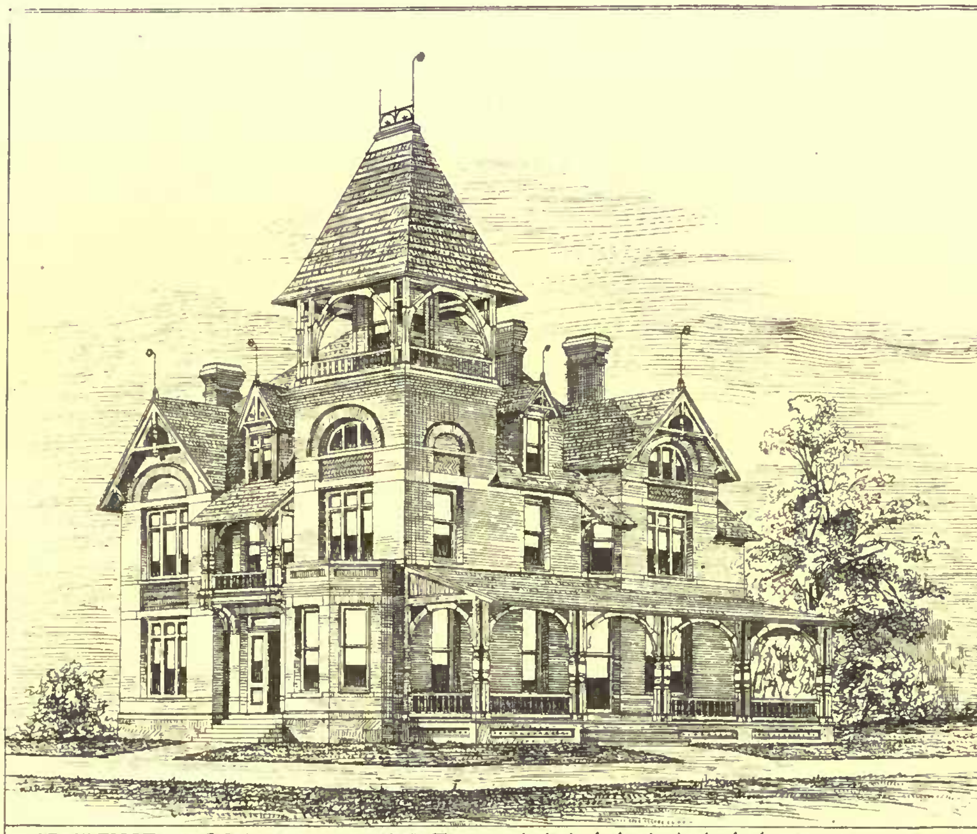
clearly how this was done. The idea was to obviate the possibility of the whole body of coal getting into a state of active combustion, as in Cuttler's grate. It either was not understood, or was for some reason practically objectionable, for it does not appear to have met at any time with success, and was soon forgotten.

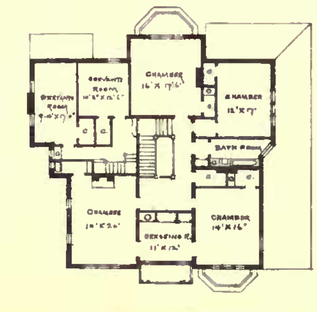
These smoke-consuming fire-places never came into general use on account of their awkward appearance, and the inconvenience of managing them. They involve machinery which is a little liable to get out of order, and few housekeepers are philosophers enough to be willing to undertake the management of a machine requiring especial mental effort, where the advantages are not directly visible to the senses. The average servant is thoughtless and impatient enough to prefer the primitive method of "discharging an avalanche of coals" upon the fire from the hod, to going through the experiments with the lever, ratchet, wheel and axle, recommended by Cuttler and Arnott.

Moreover, the complete combustion of the smoke, and indeed everything else connected with the fire, has been considered of minor importance, compared with obtaining a "good draught" at any sacrifice. If we assume that but an eighth or a tenth part of the fuel takes the form of unconsumed smoke, and consider that a tenth part of the entire heat generated by the fuel is more than we ordinarily realize, the saving by the use of a smoke-consuming apparatus would, in an ordinary fire-place, amount to only about a hundredth part. It is evident, therefore, that such a refinement on the score of *economy* is

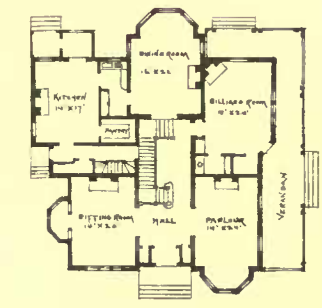


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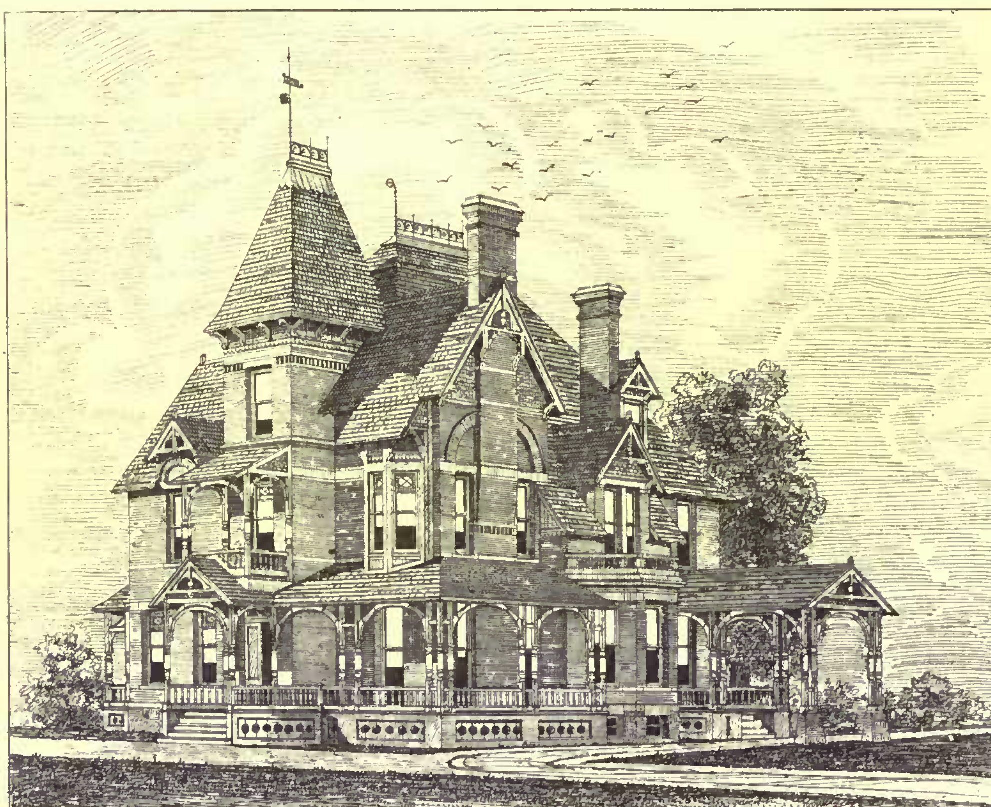


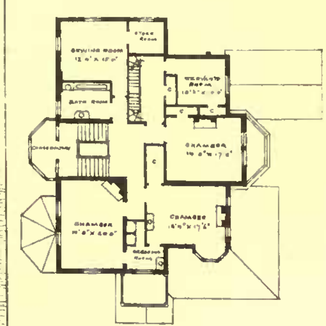
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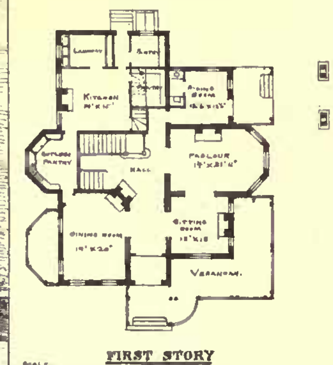
FIRST STORY

RESIDENCE OF BENJ. W. WOOSTER ESQR., ALBANY N.Y. WM M. WOOLLETT ARCHITECT ALBANY N.Y.





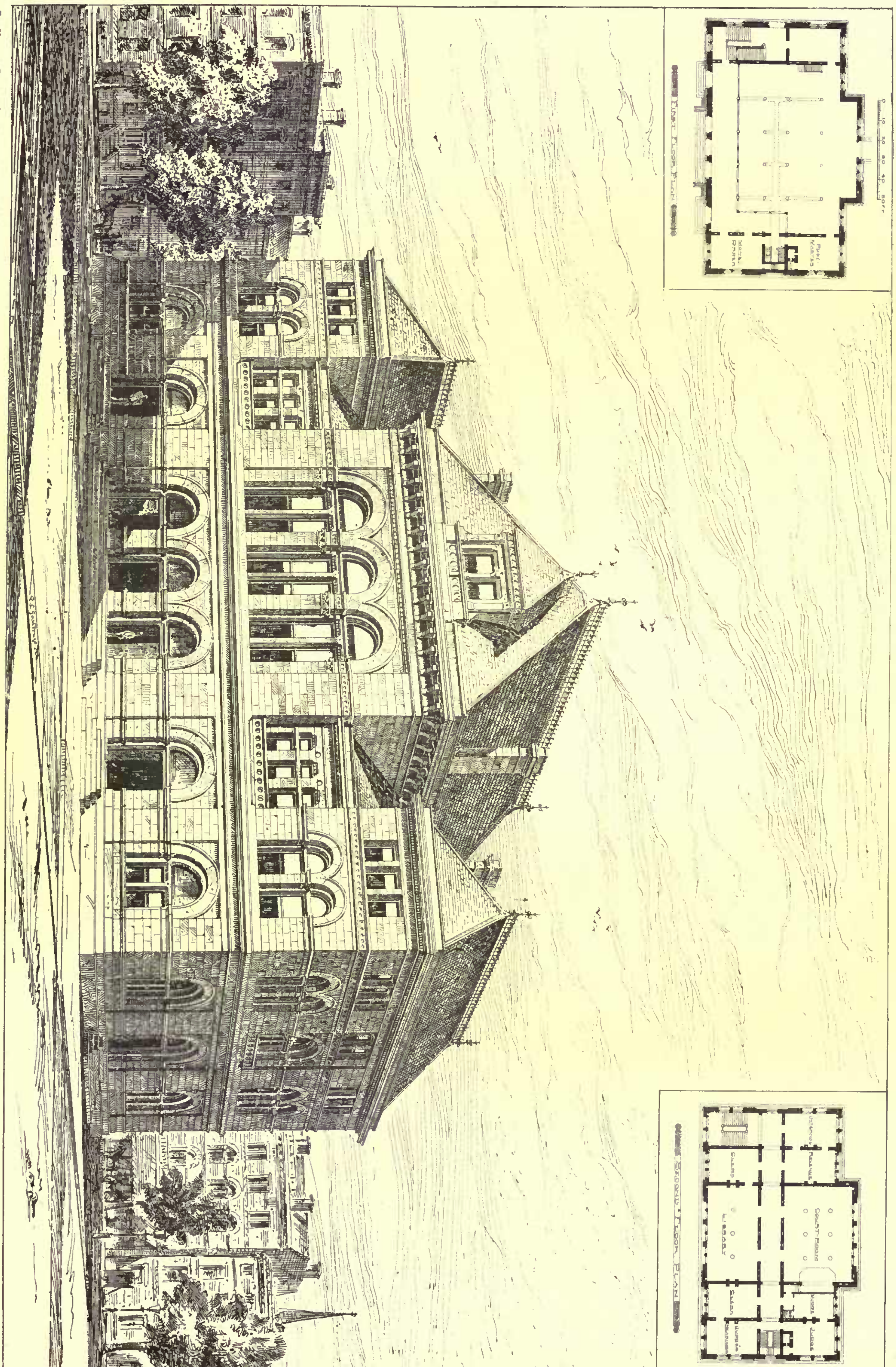
SECOND FLOOR



FIRST STORY

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VIEW ON BERKELEY ST. BOSTON.
DRAWN BY E.C. CABOT, ARCHT.

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absurd, *so long* as we allow the waste in other ways to be so large. If we throw away nine tenths of the fuel consumed, we cannot complain of the loss of the one tenth of the remainder which is unconsumed.

THE ILLUSTRATIONS.

U. S. COURT-HOUSE AND POST-OFFICE, UTICA, N. Y. MR. J. G. HILL, SUPERVISING ARCHITECT OF THE TREASURY DEPARTMENT.

THIS building measures seventy-eight feet by one hundred and twenty-eight feet. Its basement walls are faced with granite from Clark's Island, Me., and the walls of its superstructure are faced with pressed brick relieved with stone-work. The Amherst Stone Company have the contract for the stone-work at $24,193. The basement is to be used for the heating apparatus and for storage purposes, while the plans show how the other floors are to be used. The floors and roof as well as the walls are fire-proof. The estimated cost is $225,000.

VIEW ON BERKELEY STREET, BOSTON, MASS. DRAWN BY MR. E. C. CABOT, ARCHITECT, BOSTON.

This is another of the series of drawings prepared by the members of the Portfolio Club.

VILLAGE CHURCH, TAININSKOJE, NEAR MOSCOW, RUSSIA.

We reproduce this interesting church from our Russian contemporary, the *Zodtchy.*

HOUSES FOR R. W. WOOSTER, ESQ., AND O. L. HASCY, ESQ., ALBANY, N. Y. MR. W. M. WOOLLETT, ARCHITECT, ALBANY.

These two buildings stand on adjoining lots facing Washington Park, the principal public ground in the city. The street in front of them being treated as a roadway of the Park, they will, to all appearances, stand within the Park inclosure. They are substantially built, and are faced on all sides with Trenton face-brick, laid in black mortar, and relieved with finish of Ohio stone. The gable-ends are shingled, and the roofs are slated.

CORRESPONDENCE.

THE TENEMENT-HOUSE COMPETITION.

NEW YORK.

NEW YORK, probably of all the cities in this country, has an interest in the tenement-house question. With such a large proportion of the gross building effort directed to this class of dwellings, the question of how best to cover valuable city lots so as to squeeze out a rich revenue in the way of rents without a too startling sacrifice of human life, and without too severe a mortality rate among the tenants, is one of the real tasks of the sanitary architect. It will not do to say that the whole thing is wrong from the start; that tenements should not be erected, and that in place of packing population away at the rate of 270,000 to the square mile, every effort should be made towards scattering the inhabitants of the metropolis out into the suburbs, or anywhere out of the great six-story barracks into two-story cozy cottages. All this may be true, and is true, but it is not practicable. We have the tenement-house population and they must be housed, and reforms, if any are to come, will only be worked out in the lapse of years. A more immediate obstacle to one reform which might be brought about in agglomerated tenements is the formal and arbitrary chopping up of city property into 25 by 100 feet plats. There is a perfect willingness on the part of real estate owners to pare down from this size, but the difficulty of selling and the inconvenience of holding buildings of larger size have made owners very shy of attempting the covering of large plats with single structures.

With these facts before them, and knowing well the necessity of at least striving after something better than the present wretched fever nests and pest holes, the proprietors of the *Plumber and Sanitary Engineer* united with Messrs. D Willis James, Frank B. Thurber, Henry E. Pellew, and Robert Gordon in instituting a competition for designs for a house for workingmen. Five hundred dollars was named as a premium to be divided into four prizes. The conditions were made very simple indeed. They supposed a lot 25 by 100 feet inclosed by buildings on adjoining lots at sides and rear. The model building was to be of brick with timber flooring. Various features were named as important to be secured by the designer. There was to be a security against fire, or, at least, against any sudden and rapid spread of fire, and as a means of escape fire-proof staircases open to the air were suggested. There was to be a proper distribution of light, by which was meant that the rooms of the tenements were to be something more than dark closets of various size. Ventilation, drainage, and other sanitary appointments were to be looked after. The plan was to be so devised that each suite of rooms should have the fullest share of seclusion, while there should be the utmost publicity of access to them. Convenience of arrangement and an inexpensiveness of construction were to be secured. Excellent and competent judges were chosen, and in December last the prospectus was sent out. The efforts of nearly 200 designers may now be seen at the Leavitt rooms in this city, where on the walls are tacked up 188 sheets of drawings, each sheet including the plan, elevation, and section of what the designer considered to be the best possible mode of putting the greatest number of people as dwellers upon the 25 feet by 100 bit of earth.

The result is a collection which took the projectors by surprise, and the range of the profession who are represented is somewhat surprising. Among the places from which plans were sent are London, Eng., Toronto, Ottawa, San Francisco, Chicago, St. Louis, Detroit, Grand Rapids, Princeton, Ill., Cleveland, Cincinnati, Toledo, Pittsburgh, Erie, Philadelphia, Baltimore, Washington, Buffalo, Albany, Brooklyn, Rochester, Rondout, Saratoga, New York, Jersey City, Bridgeport, New Haven, Springfield, Providence, and Boston.

The award of the judges is not to be made until the 18th instant; in the mean time the drawings are open to criticism. The plans are capable of a general classification since there are but few changes to be rung on such a restricted programme as the covering of a city lot. Not a few of the competitors fail, however, to appreciate, even in the remotest degree, what a New York tenement must be. With a building law which permits a six-story structure it is simply ridiculous to plan a two or three-story affair. It would not pay, and that suffices to lay such a drawing among the impracticables. Then, too, it is sheer nonsense to provide the tenement-house dweller of to-day with anything like the number of conveniences which appear on many of the plans, and the plea that they were to act as educational influences would not hold. A dumb-waiter, even of the simplest sort, would, in all likelihood, be a constant source of wrangling among the tenants. There are a hundred other minor points which, to one who is familiar with metropolitan low life, are at once detected, while it would require columns of space to explain the why and wherefore of each decision. The designs are, of course, under motto titles; and it would always be well if competitors would use words instead of emblems as distinguishing features: —

The Leader has a four-story building with a dark hall, but the rooms have outer light and air. The stairs are thrown to the central section, and with baths, elevator, etc., the whole has too much of the French flat. The front is plain.

Ferrum is rather odd. Its odd rooms with bunks for "men without families," and a cork-screw staircase, with the whole front as a fire-escape, show that the designer did not comprehend the problem.

Suprema est Lex Salus Populi builds the front in a bold way with large arches, puts a stairway at the front in an 8 ft. by 13 ft. well, then comes a long passage and eight rooms in line to the rear stairs.

Nutshell, 1879, has a poor plan with long passages, and puts the stairs in the centre of a well. He gives a very carefully designed ash-sifter, however.

A Greek cross in a quatre-foil constructs two separate buildings, with a 19 ft. well between them in which the wrought-iron stairway is fixed. It is a compact plan and gives variety of apartments.

Maison Ouvrière has a double entrance, one for first flat only, and in other ways it is a very wasteful plan.

Another for Hector has a stairway out of doors, very like a permanent fire-escape, and, with the three entrances, is too much of an innovation to be at once popular.

Homes has a single plan, a well 6½ ft. by 50 ft., with the stairs thrown to the centre of the plan.

Facimus in elevation shows six windows across a 25 ft. front. The building is not a tenement, but rather a community house, a general laundry being provided, but the rooms enjoy borrowed light, and this is not fulfilling the conditions.

Nor would you find it easy to compose is a long title for a poor plan; its passage-ways crossing wells.

No. 67 is a petty flat, with a pretentious-looking frontispiece. There are dozens like it in the city.

Stat Nomen in Umbra is a double house, with the stairways and offices thrown to central part. The elevation suggests a grain elevator, while the broad side entrance has the look of a cartway.

Unity shows a plan which has many dark rooms, and the plumbing as shown would have to be very carefully looked after.

W & W has a peculiar plan, and it is questionable whether a sitting-room without either fireplace or chimney is a correct sanitary arrangement. It shows a shaft next the outer open side.

Cleanliness next to Godliness is a very good plan, with outside light, but it is rather too gorgeous, too elaborate, for a New York tenement.

Diagonal Court sets out with a disregard of the idea that the next lot was to be built up. A diamond-shaped court is carried down in the p nn, and where this is open at the angles to another court all may go well, but otherwise it may not.

Thor compels his first-floor tenant to travel back fifty feet, and generally makes too free a use of the ground. The stairways are thrown to the front.

Hope is symmetrical and double, but no specially novel features are shown.

Ante Legem places water-closets where there is no possible chance of outside ventilation, while he provides a liberal well for light and air on the opposite side.

Air is Life is very careful against fire, and makes elaborate preparations to ventilate the great shafts by making double floors below the first story. Whether this way of receiving air-ducts would be altogether satisfactory could only be settled by actual trial, and that would be expensive.

Ben Trovato puts a big well in a very small house, and therein does not meet the full problem.

New York provides permanent refrigerators and such luxuries, and a great fire-escape in front, but nevertheless has within the fault of dark rooms.

Metropolis, with a very heavy exterior, adopts the dumb-bell plan, or a constricted central section in which the stairs are arranged. The central rooms are dark, and the suites are so arranged that one room is passed through to reach another.

H. is a tenement in fact as we know them in New York, and the yard contains what is called a "close-poll" for holding pulley lines.

The Workman is a poor plan with much explanation in text. Its dark rooms are inadmissible.

Non Conscire Sibi is divided into three parts, with the stairs in the central shaft and bridges to front and rear. There is more in the plan than has been gotten out of it in this drawing.

Your Kind Consideration should have been better drawn. The stairways are securely placed in a central shaft.

Fiat justitia, ruat cœlum throws away half the front, and no New York capitalist would ever think of adopting such a plan.

H. M. has the fault of dark rooms, yet the front of the building has the look of a grand window.

Octagon has front and rear building with different levels of floors. The water-

closets are put in the centre, and with a fair elevation the whole design takes rank among the desirable ones.

Light, Air, and Health sends in four designs, showing differing plans. A. gets ventilation by wasting his ground. B. divides the lot into two parts with two sets of stairs. C. has the dumb-bell plan, with the dark rooms, and D. adopts the corridor plan. It is difficult to conceive of four situations where these plans would be severally required.

Sanitas gets three sets of plans on a floor, and takes two sets of stairs to reach them.

Posse Potens has a very elaborate plan, and not only duplicates the apartments on each floor, but the back-yard as well, and there are half a dozen of these appendages.

Improved puts a very conspicuous stairway at the front, but allows his plan to show dark rooms, and the only merit in the eyes of a builder is that it covers the lot.

Ut Prosim also covers the whole lot, and has three sets of stairs. The elevation suggests a shot-tower.

Lux has looked after the ventilation and has carried a hollow in the side wall from front to rear. A spiral stairway is not a recommendation to tenants.

Onyx makes a liberal use of the ground, but seems to have peculiar notions of tenement life, seeing that he provides the kitchens with drying rooms.

Peter Cooper shows a double house on a good plan, with the stairways carried to the centre.

Health is Happiness has prepared a good plan for a small town where compact accommodations are not required.

Si Placeat, a London designer, has a long side court, and a front elevation which would not discredit a Trappist monastery.

Cui Bono places a number of small buildings along the side of a court.

Oxygen presents an elevation with a double gable, and one of the most carefully studied plans in the collection. An open door and stair-wells give ample ventilation, and all the rooms have an out-door exposure.

Utility carries a passage down the centre and places the stairs in the central shank of the dumb-bell plan.

Suum Cuique carries up a stairway in a central tower in front, and has a laundry on the top floor in front. The rear of the lot has another staircase with light shafts.

E. L. has a dark hall, with two small courts. It is, however, a good plan and a compact one.

Midnight Oil adopts the side court plan with balconies on each floor. It is a good plan with a very careful elevation.

L. C. E. does not do justice to himself in a poor drawing.

Light and Air, also, has peculiar notions of what a metropolitan tenement is when he provides a "sewing-room" in conjunction with the dining-room; a spiral stairway in a well, and a front elevation which is certainly peculiar, mark this mistaken design.

The Poor offers a novel plan and design; a corridor nine feet wide is provided, and generally it is an innovation.

The poor ye have always with you has an upper and lower store, and a stairway further in the rear. There are dark rooms.

Householder, No. 1, has the ordinary dumb-bell plan, with a peculiar water-closet arrangement.

Bedtime puts a small building at each end of the lot and then a long, narrow building set diagonally across the court.

Excelsior has a great bay window in the front, but further back rooms are nominally lighted by those V-shaped breaks in the side wall.

Permitte Divis Cætera sends a careful drawing, with five windows across the elevation, but the passages are dark, and the rooms are lighted from some very small shafts.

Exitus Probat has the side court, with stairs at each end of it, with the water-closets in the rear. It is one of the best plans of its class, and, but for an unfortunate use of red ink in showing the piping, would stand a good chance for a prize.

17½ by 24 has the dumb-bell plan with the little V shaped shafts, and gives the coveted "outside exposure."

Modernizer has designed a very ambitious elevation with an alternative design, — a double dumb-bell with a well in the centre, — making a very crowded plan.

Advance has two plans, of which No. 2 is best, being the most open.

Health is Happiness carries up a curious extension in the rear, and places a good-sized shaft in the centre of the front building.

Peabody obtains a good elevation, not at all showy; but the dumb-bell plan shows dark inner rooms.

Wyoming puts two buildings on the lot, with a fourteen foot court between. Each building has a circular stairway in it.

Comfort appears with dumb-bell plan, and tries to light a bedroom from a small shaft into which he also ventilates water-closets.

I strive is a side plan with a double shaft. It covers the whole lot, and compels the tenants to turn rooms into thoroughfares.

Excelsior designs a three-storied building, but puts water-closets into the corners of bedrooms as though they were ordinary clothes-presses.

Simplicity uses an open central well with the stairs winding about it.

Delta makes things very compact, so much so that a tenant may lie in bed in one room and stir the fire in the next.

I. F. S. H. has a double staircase and a passenger elevator, but nevertheless dark rooms.

Pro eo ac Merce makes a dumb-waiter the central feature of the house. The little V shafts are seen.

Comme il faut uses a stoop, and carries up the elevation into a Mansard; a corridor with two stairways is provided.

Pro Bono Publico, with anchor emblem, sends alternative designs, with the stairway in a side tower at the front, and again at the rear; but for the borrowed light in the central rooms the plan would be among the best in the collection.

Hard Cash has made some very picturesque drawings of a dumb-bell planned house, and the water-closets are well exposed, but the double dark rooms are met.

Eureka has a double dumb-bell plan, and puts side windows in the house, although the adjoining lots are supposed to be built up.

Prüfet alles, das Beste behaltet, presents a wonderfully ingenious plan with a staircase tower in centre of front.

Fais ce que dois; advienne ce que pourra, has an Italian tone about it with a court eighteen feet across and a balcony in centre. All the rooms are light.

Seven per cent has a good plan with a central shaft and stairs about it.

Dieu défend le droit sends in a design of a most elaborate character with a front to match; but a cost of over $16,000 will check building on that plan.

Health before Wealth has two buildings on the lot, but there are dark rooms in them.

A quatre-foil in a circle sends a low building, with three sets of stairs and a double light shaft. The plan is out of place.

Mutatis Mutandis provides a strong central stair shaft of brick, from which the front and rear building may be cut off at any floor. A general lavatory is a peculiar feature in this building.

Utility wastes room in private halls, while the stairway in the centre is dark.

Tentative has an interior court and a semicircular staircase abutting upon it.

Through Draft provides a store 6 by 11 feet, bedrooms 6 by 15, and such.

Bonâ Fide has one of the best elevations, with a dumb-bell plan, and corridors reaching each suite.

Light and Air covers the entire length of lot with side corridors from front corner stairs.

Pauper, in the front elevation, starts a main central pier boldly from the top of the arched front door. The plan is a peculiar one and leaves much vacant space at the rear of the lot.

Sunshine provides three houses with liberal air shafts between.

Qui peut plus, peut moins, of Boston, opens a court, 11 by 27 feet, at the side; he has considered such niceties as providing separate ash and swill chutes, and in fixing his suites makes the sitting-room answer as ante-room to the others.

Concours shows a plan where every room is an outside one, and of all the side-court plans this seems the best.

Domesticus shows something very near the old double-decker, so common in our city now, except that a court rises beside the stairway on one side.

The Hypothenuse Problem covers the full lot, with a design showing a good elevation above the first story.

Sun and Air raises a fantastic front, but in plan there is a waste of room, and dark bedrooms as well.

Pericles takes an air court, 15 ft. by 20 ft., in the centre and carries up his stairway beside it.

Geo. Peabody puts the stairs at each end of a long and dimly-lighted corridor

Pro Bono Publico has a plan which would answer admirably for a small hotel.

Ut Prosim shows a very fair elevation, but the plan is not commensurate with it.

Air and Light, No. 2, has an excellent plan, but the elevation is poor and should be improved.

Such is a brief mention of many of the plans sent in. Some fulfil the conditions, but many miss them, either from misconstruing the terms or from ignorance of what a tenement in a great city actually is. W.

THE GHIBERTI GATES.[1]

THIS is, perhaps, the most attractive of the heliotype reproductions of the firm which publishes it. It is a slender quarto volume containing thirty-three plates in heliotype, very well executed, illustrating Ghiberti's famous eastern door to the Baptistery at Florence, with an explanatory text by Mrs. Julia A. Shedd. It would be unreasonable to expect that such a work should have the value of good photographs from the bronze itself, but these are not to be had without difficulty and expense, and many people who would like to have the photographs, but cannot, will be thankful for the opportunity to substitute the more accessible heliotypes. They are taken from the cast of the door in the Corcoran gallery at Washington, and include a heliotype of Canova's bust of Ghiberti in the Capitol Museum at Rome by way of a frontispiece, a very good view of the Baptistery itself, a view of the whole of the Eastern door, and enlarged prints of each separate panel, niche, and section of enriched border, the whole giving a very complete, detailed representation of Ghiberti's great work.

The chief criticism that the illustrations suggest touches the way they are lighted. It is evident that the east was photographed by artificial light, perhaps necessarily. The light was concentrated on one side, and very low, almost at the bottom of the door. The effect of this is very injurious. The shadows are exaggerated and misplaced, and the half-tints inevitably lost, so that the whole is thrown out of balance. This necessarily does injustice to the effect of the compositions, bringing the lights and darks into positions and relations which were not intended. The alteration of effect is increased by the difference between the white color of the cast and the dullness of the bronze. By this the bold relief and modelling and cast shadows are made to tell with exaggerated force, while the strongly concentrated light and shadow obscure the modelling of the figures, which is already somewhat lost in the plaster reproduction. It is a delicate matter to photograph any piece of sculpture by artificial light, especially one of so complicated effect and so much small detail as these bas-reliefs, and should not be undertaken without the supervision of a skilful artist, who can enter into and preserve, as far as may be, the character of the original work. The faults we have here noticed will be seriously felt by artists, but enough remains of the beauty of the original sculpture to make the reproductions valuable for reference and study notwithstanding.

ANTIQUARIANISM IN RHODE ISLAND.

AMERICAN INSTITUTE OF ARCHITECTS: RHODE ISLAND CHAPTER.

PROVIDENCE, February 10, 1879.

AT a meeting held February 5, a committee, previously appointed to consider and prepare a scheme for interesting the architectural draughtsmen and students of the State in the work of the Chapter, made a report in print, which was adopted and ordered to be carried into effect. In accordance with this report the Chapter invites all architectural students and draughtsmen of Rhode Island, without distinction of age or sex, to unite with it in preserving a record of such ancient buildings, especially those built in colonial times, as may be worthy of such notice, and to this end has instituted a competition, the special prizes and terms of which may be learned on ap-

[1] *The Ghiberti Gates:* An Account of Lorenzo Ghiberti, and the Bronze Doors of the Baptistery at Florence. By Mrs. Julia A. Shedd. Boston: Houghton, Osgood and Company; The Riverside Press, Cambridge. 1879.

plication to the Secretary of the Chapter. It is proposed to make a public exhibition of all drawings sent in response to this invitation, appending, to those receiving prizes or honorable mention, the names of the authors, amount of award, etc. There are many buildings in the State, interesting from their historical associations, architectural merit, or as types of colonial buildings, and it is hoped that we may thus be enabled to obtain a worthy record of them. The selected drawings are to be bound or otherwise preserved, by the Chapter, the author being allowed to make copies of them if he so desires. Drawings must be sent, anonymously, to the Secretary, before September 27, in order to receive consideration.

CHAS. P. HARTSHORN, *Secretary.*

The invitation addressed by the Chapter to draughtsmen runs as follows: —

THE R. I. CHAPTER A. I. A. invites the architectural students and draughtsmen of the State to coöperate with the Chapter in making and preserving a record of the noteworthy buildings erected in the State from the date of its settlement, and especially of those built in the colonial times. To accomplish this object the Chapter invites you to participate in a competition, the terms of which are appended for the guidance of those who take part therein, and offers the following suggestions and directions as to selection of subjects and method of illustration: —

FIRST. That a building be chosen because of its historical associations, because it is a characteristic example of a type of buildings, or because it possesses, to the eye of the student, architectural merit, as a whole, or in part, which deserves to be recorded and preserved.

SECOND. That after such selection, accurate sketches, measurements, and surveys of the buildings be made, including the fences and out-buildings when they possess marked architectural features, observing and recording peculiarities of construction and detail, especially noting the changes which have been made, the date when they were made, and the points of resemblance, or otherwise, between the new parts and the original structure.

THIRD. To draw out carefully to a scale the building and its various parts, in such manner as the student may prefer, in order to make clear the character of the structure as a whole, and to illustrate its details; the drawings to include a neatly drawn pen-and-ink perspective sketch of the building.

FOURTH. To send with the drawings a manuscript containing a description and historical sketch of the building.

TERMS OF THE COMPETITION.

The competition is open to all architectural draughtsmen and architectural students in the State, without reference to age or sex. All of the drawings must be anonymous to the Chapter, and must be marked with a cipher or motto, and accompanied by a sealed envelope designated by the same cipher or motto, and containing the name of the author of the drawings submitted. The drawings must be made on sheets of Bristol board, or of Whatman's hot-pressed paper, 14 in. x 22 in., with at least 2 in. margin, but as many sheets may be used as are desired by each author.

The Chapter will give four prizes, as follows: —

1st Prize, $15.00; 2d Prize, $10.00; 3d Prize, $5.00; 4th Prize, $3.00; or any architectural or scientific works of equal value.

The Chapter will be governed in the distribution of the prizes by the excellence of the selection and the method of its treatment, having reference not only to the accurate and graphic drawing of the buildings and the details thereof, but also to the arrangement of the drawings and the description of the structure, and honorable mention will be made of such other drawings as are, in the opinion of the Chapter, worthy of such distinction.

The Chapter will retain all drawings upon which prizes are paid — giving the authors an opportunity to copy them if they desire to do so, and would be glad to retain those which receive honorable mention, and pledges itself to carefully preserve them and to bind or otherwise dispose of them so that they can be easily inspected and exhibited.

If the response to this invitation is as liberal as is anticipated, it is proposed to make a public exhibition of *all* the drawings received, appending to those which receive the prizes or honorable mention the name and address of the author thereof, and the prize awarded to it.

Drawings may be sent (post-paid) to the Secretary, CHAS. P. HARTSHORN, 6 Exchange Street, Providence, on or before 12 M., of Saturday, the 27th day of September, 1879, and any received after that date will not be entitled to a prize, unless it is shown that it was by accident and no fault of the author, that the drawings were delayed in delivery.

For further information address the Secretary, or any member of the Chapter.

A. C. MORSE, Pres't, 42 Wilcox Building, Providence. ALFRED STONE, V. Pres't, 65 Westminster St., Providence. C. P. HARTSHORN, Sec'y, 6 Exchange St., Providence. GEO. C. MASON, Jr., Treas., Pelham St., Newport. CHAS. E. CARPENTER, 65 Westminster St., Providence. GEO. W. CADY, 164 Westminster St., Providence. JAMES MURPHY, 54 North Main St., Providence. DUDLEY NEWTON, Bellevue Ave., Newport. JAMES FLUDDER, Bellevue Ave., Newport.

VOLCANOS AND THE MICROPHONE.

IN an article communicated by Professor de Rossi of Rome to the *Bullettino de Volcanismo Italiano*, we find an interesting account of some experiments with the microphone and telephone combined, to determine how far these instruments will serve in the science of terreous meteorology, and the result seems to be highly satisfactory. In 1865, and, therefore, some years before Mr. Edison made himself so much talked of, Professor Mocenigo of Vicenza published an account of an instrument of his invention, containing all the fundamental principles of the microphone; but as he devoted himself chiefly to perfecting it, with a view to its usefulness in his special branch of science, meteorology, the microphone was invented while he was still studying. Professor Rossi at once saw the possible importance of the new invention, and, as in some experiments made at Vicenza, the telephone emitted sounds which could only be attributed to subterranean agitations, he determined to make some further experiments himself in an underground observatory of his own at Rocca di Papa, situated on the Alban Hill, on the edge of the crater of an extinct volcano. A special microphone, capable of being attached firmly to the rocks so as to feel any motion there might be, was carried down with great care into the observatory, and the professor anxiously sat by it till late into the night, waiting for the hour when all was at rest and silent, to catch any sounds that might issue from the telephone. He soon found that the mysterious sounds mentioned to him by his brother professor were not fanciful; and, though uncertain as to their causes, he was soon able to divide them into three classes, which he calls rumblings, musketry reports, and metallic or bell-like sounds. He also discovered that the sounds were periodical at intervals of an hour, or half an hour, or even smaller fractions.

"Meanwhile," he says, "nature was favorable to scientific inquiry, for on one side Vesuvius was becoming active, on the other several slight shocks of the earthquake were felt at Rocca di Papa; thus it happened that twice I was listening to the telephone when slight shocks were felt, and I noticed then that they were preceded and accompanied by the sounds I have described. This happened while Vesuvius was increasing in eruptive activity; and on the night of the 22d of September, at the hour when the explosions of the volcano and its eruptive cone were most vigorous, my microphone on the Latin hills was in the greatest agitation. On the following days the same sounds continued, following more or less exactly the course of the eruption of Vesuvius. Wishing, however, to complete my evidence, I determined to carry my microphone to a place where there was no doubt of being on ground vibrating from inner causes — to the sides of Vesuvius and the Solfatara of Pozzuoli. Professor Palmieri not only put at my disposal his observatory, but did all in his power to make the experiment a fair one, himself watching at the outer door to prevent all intrusion or accidental noises. We wished here to establish the connection between the motions of the seismograph and the sounds communicated by the microphone. To ascertain this, one of the assistants of the observatory stood over the seismograph, to mark the motions with signs previously agreed upon, to record the agitation preceding a shock, the actual shock itself, and whether the motion was undulatory or perpendicular. At the same time the sounds of the telephone were noted, and found to correspond exactly with the motions of the seismograph; and each different motion corresponded to a different sound. In this way it was possible to ascertain the value of the different sounds, which had naturally been impossible at Rocca di Papa; and it appeared that the perpendicular motion corresponded to the musketry reports, and the undulatory to the rumblings; while very often there was an uncertain sound, as had been noticed at Rocca di Papa. It appears, too, that the microphone, when placed on ground continually agitated, works with great energy even when not accurately adjusted, and this became still more evident when taken to the Solfatara of Pozzuoli. Here, indeed, I expected greater results than on Vesuvius, as the area of eruption is more confined, and it was more easy to approach the centre of activity; and I was not disappointed, for the microphone, before being adjusted, when artificial vibrations had no effect on it, repeated violently the shocks and rumblings at the bottom of the crater. When the balance had been slightly adjusted the reports became so loud that there was no necessity for holding one's ear to the telephone, and it was quite sufficient to place it on the table for every one present to hear the sounds. Learning that I was about to repeat the experiment, many people came to assist, and all, but chiefly the ladies, could hardly repress a feeling of fear at hearing the force, rapidity, and variety of the sounds, which showed what a terrible furnace we were standing over. The most interesting part to me, however, was that there was no difference, except in intensity, between these sounds and those heard at Vesuvius and Rocca di Papa; and it was hence evident they all proceeded from volcanic sources. But while our ears were filled with these noises there was no sensible motion experienced, as I had also remarked on Vesuvius, and, except in the two moments of earthquake, at Rocca di Papa. Still, it is evident that the microphone both at Vesuvius and the Solfatara was registering shocks of earthquake otherwise imperceptible; and, as the same sounds had been observed by Professor Mocenigo at Vicenza, and Armellini at Rome, there can be no longer any doubt of the existence of microseismic vibrations of the earth as discovered by Bertelli and maintained by me. In other experiments I have found it sufficient to place an ordinary watch under a nail and pass the electric current through this simple medium to catch the seismic sounds. The first thing, then, that science requires in the application of the microphone to meteorology is to obtain an instrument which will mark automatically all the variety of sounds which the microphone conveys to us; and this will be the much-desired 'panseismograph,' which will show the number, form, and every variety of the vibrations of the earth." — *Pall Mall Gazette.*

NOTES OF EXPERIENCE AND INEXPERIENCE.

[EXPERIENCE.]

1. ROOFING PAINT. — "Y," under "Notes of Inexperience," asks for a good, inexpensive paint for country house roofs. I have tried many colors and materials, and have found no low-priced article better than the so-called "Turkey Red" of E. & F. King & Co., Boston. It is a better color for coarse work than the ordinary Indian red, and costs about one quarter as much (*i. e.*, about two cents a pound in the dry color). There is also a color, made by the same firm, from the "Gay Head" earth, and called "Wing's Red," which is sold for one cent a pound or less, dry. This is about the tint of hard burned Philadelphia pressed brick. It grows somewhat lighter by exposure, but still is a very good color for a roof. To make a good roof, the shingles should have the butt-ends dipped, for about an inch, into thin paint, which should be smoothed up with the brush for a short distance on the under side, and for about two laps on the upper side and edges. Another coat should be applied over the entire roof after laying; treated in this way, if the shingles are of good quality, they will be very durable. If painted only after laying they will not last so long as if left unpainted.

JOHN A. FOX.

FIELD'S FLUSH TANK. — C.'s experience with Field's Flush Tank differs from mine in two respects. Perhaps the fact that his is buried deep in the ground, and consequently retains its heat longer, accounts for its working so very long without interruption from grease. Mine is mainly above ground, and we have to clear it out about twice a year.

On the other hand, I don't see how — even with the digging needed to get at it — the work could have cost $6! It takes less than an hour for one man to clean mine thoroughly, — very much less than the time that had to be spent on the drain and the absorption pipes before we used the Flush Tank, when obstruction was of frequent occurrence. W.

5. Saylor's Portland Cement. — In answer to "Mason's" inquiries we send the following report of a test on one thousand barrels delivered to the New York Department of Docks; stock is always fresh as it leaves our hands, and you should be able to get it fresh and in good condition from Messrs. R. G. Morse & Co., 498 Albany Street, Boston, Mass. Also, of Messrs. D. Roby & Co., 280 Causeway Street, Boston, as they are regular buyers. Johnson & Wilson.

Copy of Report from the Department of Docks, New York, of 1,000 *Barrels of Saylor's American Portland Cement.*

(Tested November 13th to December 20th, 1877.)

Vessel.	Marks of Cargo.	Date of Receipt.	No. of Bbls.	Average Gross Weight per Bbl.	Average Weight of U. S. Bushel.	Liming.	No. Bbls. from which Sample was taken.	No. of Bbls. Damaged.	Average Fineness.	Average Tensile Strain per Square Inch.	Cracks.	Number of Minutes in Moulds.	Remarks.
Lighter.	Saylor's American Portland Cement.	November 12 to December 6, 1877.	1,000.	400 lbs.	131 lbs.	Good.	105.	None.	82 per cent.	347 lbs.	None.	53 minutes.	The requirements of this Department in purchasing were as follows: — Weight per bbl. . . . 400 lbs. Weight per bushel . . 110 lbs. Fineness . . . . 80 per cent. Tensile strain per square inch at seven days . . 25) lbs

To G. S. Greene, Jr., *Engineer-in-Chief.* — W. W. Maclay, *Assistant Engineer.*

New York, December 21, 1877.

[inexperience.]

6. Centrolinead. — I have heard draughtsmen speak of the "centrolinead," an instrument used for perspective drawing. Can any one tell me how it is used, and whether it is worth buying? Is it the same thing as the "Perspective Linead" which I have seen advertised in the *American Architect?* Vanishing Point.

7. Georgia Pine. — Has any one ever experimented on the difference in strength between hard-pine timber from virgin trees, and that from trees which have been tapped for turpentine? And if so, what is the amount of the deterioration? It is something serious, and it would be worth while, also, to know the best way of specifying and recognizing timber which has not been exhausted of its sap. Georgia.

NOTES AND CLIPPINGS.

Poisonous Papers. — In a series of samples of glazed and plated papers examined for the State Board of Health, and intended to be used largely by children, Prof. E. S. Wood has found arsenic present in dangerous amount in all but one of the greens, one scarlet and one red, and a small quantity in one blue and one chocolate brown. (*Note from the Mass. State Board of Health.*)

A New Florentine Museum. — The *Academy* states that the invaluable stores of antiquities which are centered at Florence, in the Etruscan Museum, the Uffizi Gallery, and elsewhere, are so crowded together and so confused in arrangement that they are almost valueless for the purposes of study and instruction. As an instance of their condition, it states that there is a collection of about thirty thousand medals hidden away because there is no space where they can be exhibited. This being confessedly the case, the project of forming a separate archæological museum is once more agitated, and as it will not be necessary to build a new building, the government will probably carry it into effect.

A Voltaic Pencil. — We copy from the Detroit *Free-Press* the following item, hoping that some of our readers may be able to imagine the apparatus and the manner of using it, which are thus rather blindly described: —

An important discovery has just been made at Paris by M. Bellet, whose invention consists of a voltaic pencil, by the use of which designers and draughtsmen will be enabled to dispense entirely with the aid of the engraver. Beautiful proofs of lithographs and etchings have been obtained by the effect of a voltaic arc produced at the point of an ordinary lead pencil. The inventor has taken out patents in various countries and a company has been formed to carry out the process, which will soon be placed before the public.

To Turn Oak Black. — According to the *Revue Industrielle*, Paris, oak may be dyed black, and made to resemble ebony, by the following means: Immerse the wood for forty-eight hours in a hot saturated solution of alum, and then brush it over with a logwood decoction, as follows: Boil one part of best logwood with ten parts of water, filter through linen, and evaporate at a gentle heat until the volume is reduced one half. To every quart of this add from ten to fifteen drops of a saturated solution of indigo. After applying this dye to the wood rub the latter with a saturated and filtered solution of verdigris in hot concentrated acetic acid, and repeat the operation until a black of the desired intensity is obtained. Oak stained in this manner is said to be a close as well as a splendid imitation of ebony.

Bamboo in the Industrial Arts. — A company has been formed in England, with a large capital, for the more extensive and various utilization of bamboo in the arts of industry, the enterprise having its origin in the multitude of uses for which the material is and for so long a time past has been employed in India Besides being used in the latter country in the construction of the implements of weaving, bamboo is there utilized for almost every conceivable purpose for which wood is resorted to in other countries. It forms the posts and the frames of the roofs of huts; scaffoldings for building houses; raised floors for storing produce, in order to preserve it from damp; platforms for merchandise in warehouses and shops; stakes for nets in rivers; bars, over which nets are spread to dry; the masts, yards, oars, spars, and decks of boats. It is used in the construction of bridges across creeks; for fences; as a levee for raising water for irrigation. It is the material of which several agricultural implements are made, as the harrow, the handles of hoes, clod-breakers, etc.; hackeries or carts, doodles or litters, and biers, are all made of it; and a common mode of carrying light goods is to suspend them from the end of a piece of split bamboo laid across the shoulder. Further, a joint of this material serves as a holder of many articles as pens, small instruments, and tools, and as a case in which the little articles are sent to a distance; a joint of it also answers for the purpose of a bottle, and is used for holding milk, oil, and various fluids, a section of it constituting the measure for liquids, in bazaars. A piece of it, of small diameter, is used for a blow-pipe to kindle the fire, and by gold and silversmiths in melting metals. It also supplies the place of a tube in distilling apparatus. These, of course, comprise but a portion of the uses for which this valuable material is applicable, and it opens up a wide field for manufacturing industries. — *Lumberman's Gazette.*

Gaur, a Bengalee City of the Past. — The London *Saturday Review*, in speaking of the late J. H. Ravensham's book, "Gaur: Its Ruins and its Inscriptions," says: The forsaken mosques and palaces of Gaur in Bengal are not, indeed, enigmas of decay, for we know something of the changes of affairs which drove away the rulers and the subjects, the Mussulman and the Hindoo, the saint and his worshippers. The spectacle of vast desolation, half covered by the work of nature, by flowers, palms, and ferns, is still one of the most remarkable that India has to show. In a deep jungle, about eight miles from the English station of Maldah, and on the banks of a stream which joins the Ganges, are the monumental relics of a vanished civilization. The jungle is scamed in every direction by strong embankments and deep trenches, by the fragments of old fortifications, and by roads which are scarcely trodden save by wild beasts. The piles of bridges and of viaducts stand out in the midst of the waste like those which, arrayed on the Roman Campagna, have been compared to lines of mourners following a nation's funeral. Here and there among the tangled branches are fragments of carved marble or of hornblende, which have been torn from their places by the cupidity, and left to moulder unseen by the indolence, of Calcutta tradesmen. The forest is full of lagoons, where the people of the city once drew water, and, where the alligator now splashes through the rank grass and weeds. What Gaur was seven hundred years ago, and what was its history before it fell into the hands of Mohammedan conquerors (A. D. 1198), is not accurately known. The victors naturally defaced, as well as they might, all remains of Hindoo art. The temples were sacked, the images broken, the peace of the imperturbable gods was shattered with blows of battle-axes and maces. Yet the materials were not wasted, and the Mohammedan invaders were more gentle than the Puritan mobs of England or the Protestant roughs of the Scottish Reformation. The marble facing of the temples were reversed, and carved in the taste of the new masters of Gaur, so that one side of a fallen stone may now show delicate ornamental tracery, while the other preserves the image of some Hindoo deity. The second period of the prosperity of Gaur lasted till about the date of the fall of Constantinople. Gaur, according to the Portuguese historian, Faria y Souza, contained 1,200,000 inhabitants, and was so crowded that at the season of religious festival, many people were trodden to death in the streets. Yet the streets were "broad and straight," and were lined on both sides with trees to protect men from the heat of the sun. After the rapine and ruin of the Abyssinian dynasty of usurpers (1487) Gaur flourished again under Husain Shah and his descendants (1494–1537). In the latter year it was sacked by the officers of Sher Khan, and in 1575 it was depopulated by the plague. Thus since 1575 Gaur has been "the abode only of tigers and beasts of prey," and has only been visited by a few travellers and artists.

A Cement for Glass and Metal. — A great deal of difficulty is experienced in cementing metal to glass. The *Faerber Zeitung* says that a mixture of two parts finely ground litharge and one part white lead, worked up to a stiff paste, with three parts boiled oil and one part copal varnish, adding more litharge and white lead as required, is the best material for joining the two substances.

The Nile Floods. — In the *Journal of the Society of Arts* Mr. B. Francis Cobb, F. S. S., says: "Another serious matter hangs on a good or bad Nile. After a bad Nile it becomes low Nile in February instead of June the next year. It was so in 1869, when the heat and the desiccation of the country in the early part of the summer were terrible, and there being no head of fresh water inland to filter through and balance or keep out the salt water of the sea, it, by its greater specific gravity, percolated inland, and supplied the wells of Alexandria, tainted the water works, and salted the Nile for seven miles inland. At Rosetta the water was unfit for man or beast, — the cattle died from it, vegetation languished and people gave famine prices for a goat's-skin of muddy, stinking water from such ditches in the country as the sun had not evaporated. The dock gates of the Mahmoudieh Canal were accused of letting in the salt water from the sea to the canal. M'Killop Pasha was accused of dredging the canal too deeply; the wildest notions went abroad; a special commission sat and deliberated upon the subject. However, perhaps the real cause of this salting of the fresh water supply of Alexandria is better understood by this time, and if we may judge by the remains of the extensive reservoirs of Roman construction in Alexandria, the Romans had no doubt found this out, and made these reservoirs to lay in a stock of fresh water to serve them during the low Nile periods."

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, MARCH 1, 1879.

CONTENTS.

MR. R. G. HATFIELD, who died in Brooklyn last week after a short illness, was one of the best known and most respected architects of New York. He had for many years been treasurer of the American Institute of Architects, and since the withdrawal of Mr. Hunt had been the president of the New York Chapter of the Institute. He was also a member of the American Society of Civil Engineers. He was born in Elizabeth, New Jersey, in 1815, and his first training was as a carpenter and builder. Being a man of active mind and studious temper, he very soon set to work to qualify himself as an architect, carrying his studies, especially in the theory and technicalities of construction, farther than most of his fellow architects, so that he became known and consulted as one of the best qualified constructors in New York. He was the architect of many buildings, a few of which were churches, but the most were for offices, warehouses, and shops. Among the best known are the City Bank and the Seamen's Savings Bank in Wall Street, the Knickerbocker Insurance Company's building at the corner of Broadway and Park Place, and the building at Nos. 31 and 33 Broad Street, which was illustrated in the *American Architect* of January 6, 1877. He wrote and printed a number of papers and treatises on professional and kindred subjects. The earliest of these was "The American House Carpenter," published thirty years ago and more, which had, we believe, a considerable circulation. The most important is his work on The Theory of Transverse Strains and its Application in the Construction of Buildings, a model of its kind.[1] He wrote a number of papers for the meetings and conventions of the Institute, among them two for different conventions on fire-proof construction, and one on The Elementary Training of the Architect. The last thing from his pen is the paper on the Old Mill at Newport, in the current number of *Scribner's Magazine*.

MR. HATFIELD's strength lay, as might be inferred from the bent of his writings, in his knowledge and skill as a constructor, although he was far from slighting either the practice or the study of the other parts of his profession. He was often consulted by his brother architects on difficult questions of construction, and in this way was employed to design the roof of the Grand Central Depot or railway station at New York, an arched iron roof of great span and great boldness of construction, the part of that building which does most credit to its designers, and which we have seen quoted very recently in a German architectural periodical. The thoroughness and accuracy of his work, and his clear sense of practical requirements, are well represented in his book on Transverse Strains. This is wrought out with a complete adaptation to its purpose which makes it the most suitable work of its kind for architectural constructors and students, and leads the reader of it to wish that the author had been able to complement it with another volume covering the rest of the statical problems that belong to building construction. He went so far as to construct and compute for the book twenty or more tables of strains, the results of his own experiments on the strength of various materials, for which he had provided an ingenious testing-machine of his own invention. The confidence inspired by these characteristics, as well as by knowledge of his unswerving integrity and judicial quality of mind, made him trusted as a referee or umpire, which he was often asked to be. After the expulsion of the famous New York "Ring" he was appointed by the reform controller, Mr. Green, to estimate the value of the work actually done on the new Court House. He was, as we have before mentioned, the architect on the committee of award for the tenement-house competition, the decision of which is interrupted by his death. He was one of the oldest members of the Institute, we think one of its founders, and his place in it will not be easily filled. His faithful and business-like discharge of the duties of its treasurer was invaluable to it, and his judicious counsel might, if it had been heeded, have saved it from some recent embarrassments. To his friends belongs the memory of a steadfast character and an unchanging personal kindliness; to his followers an example of unusual achievement, with far less advantages than belong to their time, an instance of an effort for thoroughness of qualification which the better opportunities of to-day have not yet made common.

[1] Reviewed in the *American Architect* for October 13, 1877.

THE article in *Scribner's Magazine*, which appeared on the very day of Mr. Hatfield's death, is an ingenious and interesting paper, in support of the theory of Professor Rafn of Copenhagen, and others, that the famous tower at Newport, R. I., commonly called the Old Mill, which has been a stumbling-block to antiquaries, is really the remains of a baptistery built by the Northmen in the tenth or eleventh century. He cites the conclusions of the later Danish investigators as to the establishment of the colony of Vinland in the beginning of the eleventh century, and its short existence. Then, having examined the undecisive traditions concerning the building and its own structure, and having concluded that neither give evidence that it was built in recent times, he finds its only counterparts among the buildings of the tenth and eleventh centuries. This so-called mill, as some of our readers are aware, is a low round tower, of rough rubble masonry, carried on eight arches, which rest on round piers. The whole tower is about twenty-four feet high and twenty-three feet across, its walls being two feet thick, and the piers three feet in diameter and ten high, with rough projections in lieu of capitals and bases. By the character of the masonry and the plan Mr. Hatfield supports the theory that it was one of the round baptisteries that were attached to very early churches; and from the fact that the piers, thicker than the walls they support, had their projection on the outside, he deduces the conclusion that it was a baptistery of the form of those at Bonn and Asti, and of many larger baptisteries or churches, — the well-known arrangement of a circular nave supported on open arches, surrounded by a circular aisle and carrying a clerestory. The projections of the piers beyond the wall they carry he judges to have been intended to support the lean-to roof of the encompassing aisle, and from certain patches of white plaster which still cling to the masonry he infers that the interior was finished in stucco, probably with moulded caps and bases to the piers, for which the rough projections which we now see furnished the corbelling. This theory, of which the last described development is Mr. Hatfield's own, we fancy, he supports by an accumulation of arguments from history, analogy, and construction, which give it a very fair appearance of probability. There is enough at least to warrant an investigation which might turn out to be a crucial test, — the digging for the foundation of the supposed aisle. If remains should be discovered under ground which should indicate that there had once been an outer wall encircling the tower, Mr. Hatfield's theory would have a very strong support.

THE legislature of Connecticut has hardly got settled in its new capitol before it finds itself in difficulty there. It is said that the piers which support the dome have suffered from unequal settlement, and that the granite facing the lower part is cracking badly. Apparently the cause of the trouble is the frailty that has beset builders from their earliest days, — the desire to get an effect of good work by making close joints where their masonry is seen, and taking less care of their work where it is out of sight. The habit of working the stones to a fair joint in the face of a wall or pier, and then tailing them off roughly in the interior to save the cost of cutting the beds, or of making an ashlar face with close joints, and filling behind it with rubble, or brickwork, has again and again, where a great weight has had to be carried, from the Middle Ages down, produced the same result. Many important buildings have been defaced or made insecure by the cracking and spalling which are the

result of this treatment, when the thick joints or loose masonry of the backing yield under pressure, and throw the weight on the neatly cut stones of the face. In this case there must be a peculiar aggravation for the legislature and commissioners in the fact that they did not entrust the care of the execution of the work to their architect, but provided a superintendent of their own, and, it is said, not only commanded the dome themselves, but in many ways interfered here and there so that it is doubtful where the responsibility for anything can be fixed.

A most phenomenal scheme for the suppression of fires has been brought forward in New York. It is proposed to build in the middle of the city a tower three hundred and fifty feet high, carrying a reservoir one hundred feet in diameter, to hold two million gallons of water. This water is to be held mainly for the needs of the Fire Department, but to be used also by the Board of Health for flushing sewers, washing streets, and the like. It is to be distributed all over the city by a special service of pipes, — necessarily, we may say, because its enormous pressure would work havoc with any ordinary system, — and let on to four thousand hydrants, so placed that no fire can occur more than four hundred feet from one of them, and that anywhere in the lower part and middle of the city twenty or thirty of them can be brought to bear upon one building with moderate lengths of hose. Each hydrant would deliver three 3-inch streams, and in case of an extraordinary fire two or three hundred such streams could be concentrated in a very small area, with force enough to throw them two hundred feet or so into the air, — enough to work considerable damage to crowds and firemen, at least, and probably to drown out almost any fire that could be got at. The water is to be pumped from the rivers by engines of a thousand collective horse-power. It is proposed to set up high columns or shafts of iron lattice near the highest buildings enclosing stand-pipes with hose couplings at different levels, so that the water may be delivered at once at the point where it is wanted.

We will not stop to examine the details of this tremendous proposition. It is claimed that they have all been worked out and that every part of the construction has been made a matter of computation. Almost any constructive scheme is possible nowadays if people will pay for it; but there is a choice of ways of spending money. For one fire that gets beyond control for want of water, there are ten that occur because faulty building encourages them, and prevents our getting at them when they might easily be smothered. To those people who dread the neighborhood of steam-boilers, or other distributors of imprisoned forces, there would be little comfort in knowing that eight thousand tons of water was suspended in a tank three hundred feet above their heads, or was straining at a network of pipes under their feet, with a pressure of one hundred and seventy pounds to the square inch; not an explosive force, certainly, but an unsleeping tension equal to half a dozen times the pressure in the boilers which they fear, backed by a flood ready to burst into their cellars with a velocity of perhaps a hundred feet in a second. What would be the cost of providing this flood we have not seen estimated, but it would certainly be enormous, many millions of dollars, which might be made more effective in other ways. This is a curious instance of a common propensity to spend lavishly upon cures, rather than make a reasonable provision for prevention. We are tempted to suggest as a more economical alternative that the city, instead of spending these millions on a possible deluge, should, after passing a rigorous fire-proof law, devote the money to paying insurance premiums on all the combustible buildings in the city; and then, — well, — let them burn.

What is to be the outcome of the many projects for the international ship canal? Where there is so much smoke there must be some fire; and no doubt if the canal was once built it would justify its existence as completely as the Suez Canal has done. But the difficulties in the way of all the proposed schemes are so great, and the comparative merits so nearly balanced, that capital has not yet gravitated to either of the two which are now most prominent, — the Nicaragua or Greytown and Brito project, in favor with Americans, and warmly supported by Admiral Ammen, and the San Miguel or Darien route, favored by the French, and lately surveyed by Lieutenant Wyse of the French navy, with the support of M. de Lesseps, the engineer of the Suez Canal, — nor is it easy for a layman to form any clear judgment. M. de Lesseps is now proposing to call an international conference, to meet in Paris in May and consider the question of routes; and Lieutenant Wyse is at Washington as the representative of his plans and the bearer of his invitations. Meanwhile, as we learn from *La Revue Industrielle*, another Frenchman, a M. Blanchet, who has lived long in Nicaragua, of how much authority we know not, comes forward with a proposition in favor of the Nicaraguan route, but proposes to avoid the cost and difficulty of cutting long canals and making the rivers Rio Grande and San Juan navigable by building huge dams across the two valleys near their mouths, so as to raise the waters of these rivers to the level of Lake Nicaragua, and make as it were a continuous lake stretching nearly from ocean to ocean, there being left only about thirty-five miles of the river canal, divided between the two ends, in which will be arranged the lockage necessary to ascend and descend between the level of the seas and that of the lake. By this means he proposes to avoid the most difficult constructions and make an enormous saving both of time and money.

MODERN CHURCH BUILDING. II.

A prominent modern mistake is in building churches too large. They must of course be limited in this respect to the means of the projectors: but, even supposing those means to be ample, there must be another restriction in the capacity of the human voice. A good speaker can be heard, under favorable circumstances, for a distance of thirty feet on each side, fifty feet in front of him, and twenty feet to the rear.[1] This would absolutely restrict the dimensions of a room for public speaking to about sixty feet square, most of the space behind the speaker being unavailable. Even with these dimensions, the corners would be useless for hearing. . . . . But it is not expedient for ordinary uses to count on acoustic conditions proving altogether favorable. Many preachers, of ability in other respects, are very deficient in elocutionary skill and power. In all public gatherings there is more or less confusion; and it is very annoying, and interferes greatly with one's profitable hearing, to have to listen intently in order to catch each word. If in addition the eye is strained in a dim light, or distracted by the glare and flicker of colored glass, in the effort to watch the speaker's expression, the comprehension of the words of holy admonition borders closely on barbaric torture.

For an oblong rectangular hall or church, free from obstructions to sound, and to be filled by one voice, the limit of size should be about forty-five feet by sixty, and the height should not exceed thirty feet. This allows for about ten feet behind the speaker, and nearly as much between the back row of seats and the wall. Such a room, without galleries, would seat comfortably in slips or pews about four hundred and fifty people; or in improved chairs with tilting seats, about five hundred. A well-proportioned room is likely, other things being favorable, to have good acoustic properties. An exact cube, great length in proportion to width, or great height in proportion to width and length, almost certainly indicate bad conditions for hearing.

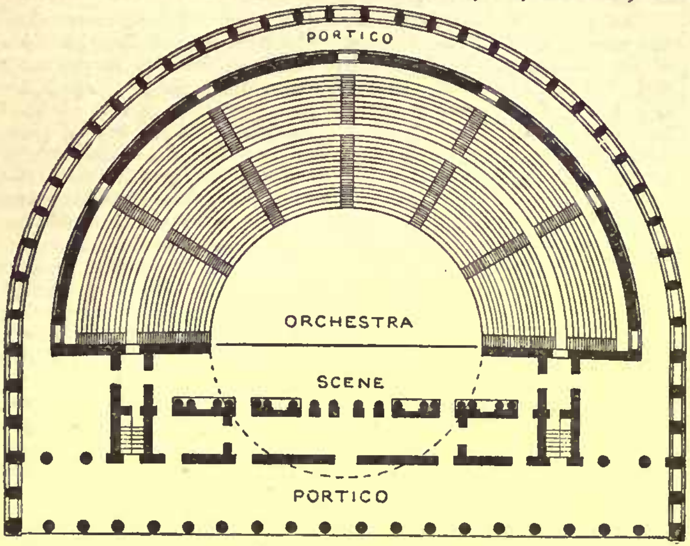
All extravagances of form, dimensions, or arrangement should be avoided. Absolutely smooth and flat walls and ceilings, and sharp corners, are unfavorable for sound. The former should be broken by moderate projections, and the latter should be cut off on straight or curved lines. Unnecessary window or skylight surface should be avoided, glass being a sound-reflector. Walls should be lined, in part at least, with material of moderate resonance, well-seasoned wood being the best for the purpose. Floors should be carpeted only where necessary to deaden sound. If there are no galleries, the pulpit or desk should be set high enough for the speaker to see the faces of the people in the rear row of seats over the heads of those in the next row in front. If there are galleries, he should stand enough higher to bring those in the rear rows of them into view. It would be better if the back seats on the floor could be raised, as it would add to the ease in both seeing and hearing. Seats should be placed to face as nearly towards the speaker as possible.

In addition to advantages of sound and sight, a room seating not over five hundred people is more readily heated, ventilated, and lighted than a larger one. A large church partially filled has a chilling and depressing effect, while a small one well filled satisfies that human love for near association and community, as essential in connection with religious as with other assemblages, and inspiring both to speaker and to hearer. Limitation in size also permits the church proper to be carried to a point of perfection in its various parts which shall make it every way worthy of its high uses. Money, instead of being lavished on worse than useless bulk, can be concentrated on the most thorough construction and the most tasteful adornment.

If for sufficient reasons, in any special case, it becomes necessary to increase the capacity of an auditorium, so that the greatest possible number can see and hear a single speaker within its walls, following out the course of reasoning already employed, we are almost obliged to adopt one form, and that is the general shape of the old

[1] These strike us as rather narrow limits. — Eds. American Architect.

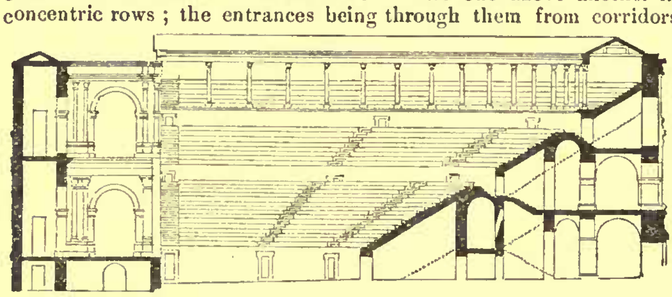
Greek theatre, or of a half amphitheatre. As it was unnecessary for their purpose, these buildings (if buildings they may be called) were



A Greek Theatre. Plan.

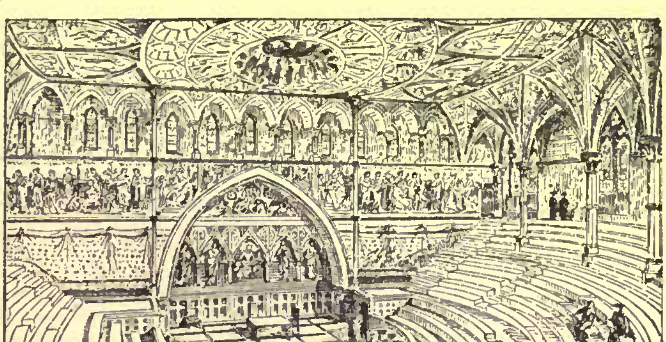
without roofs, and only partially walled. These deficiencies must be supplied and other changes made to suit modified uses and a different climate.

The plan would be semicircular, or nearly so, with the pulpit, rostrum, or reading-desk near the centre of what on the Greek plan was called the orchestra. The seats would rise one above another in concentric rows; the entrances being through them from corridors



A Greek Theatre. Longitudinal Section.

below, or down easy flights of steps in the aisles. In order, with this form, to seat a larger number, one or more shallow galleries may extend around the outer circumference. In case this form of auditorium were enclosed within a rectangular building, the triangular corners might be used for stairways to the galleries. As building on curved lines increases all items of expense very materially, it answers the purpose almost equally well to adopt for the form of the plan a half octagon or decagon. This has been adopted in the Sanders Theatre in the Memorial Hall at Cambridge, Mass.; and this or the curved form in various academic and other lecture-halls in Europe,



Speech Room, Herrow School.

almost invariably with success. It is an arrangement eminently well suited for the uses of the preacher, lecturer, singer, or actor. Without any irreverence, or any desire to attract attention by extravagant or radical statement, it may be safely said that any one who seriously and intelligently studies and investigates the public needs will find that, for the above purposes, one general form is equally well adapted.

It does not by any means follow that the church should closely resemble the theatre. It may be left to the idolatry of the "Gothic Revival" to force all buildings into the garb of a church, making the distinction between town hall, railroad station, and cathedral merely nominal.

The semicircular form of plan should be adopted only where its fitness is unimpeachable; and its style of treatment may be so varied as to be in every way appropriate to its intended service.

There is no one style in architecture that is suited more than another to religious uses. That a church should give the impression of being a church is undoubtedly true; but the effect should be produced by the absolute fitness of every part to the particular ceremonies for which it is intended.

Thus far our consideration has been confined to the part of a church used for the purposes of preaching, singing, and other devotional exercises. But modern customs require something more than this in the form of vestry, assembly rooms, or parish-parlors, study for the clergyman, and various other smaller rooms and offices. It is very common to unite these directly with the church proper, — in the basement, in an upper story, or in one or more stories at either end or side. This is often done as a matter of economy, to unite as much under one roof as practicable. But the economy is often more fancied than real. A detached or semi-detached building would often serve the purpose better, and could be treated more directly and successfully for its intended use than if made a part of the larger structure. This separation would also lessen the risk of destructive fire.

Although, as was said before, it is not proposed here to consider any matters of morality, except as they apply to people of all creeds and doctrines, the suggestion may still be in place that there is a considerable class, in nearly every denomination, who look upon the church itself as fitted only to be used for, and associated with, regular religious services; and it would be better, rather than that their feeling of sentiment, even if it be no more, should be carelessly disturbed, that the separate uses should be confined to different buildings. By adopting this system the house of worship could be made better and more beautiful in all ways; while the house for the church family could be equally well, and more simply and economically, fitted to another class of wants.

The only way to build a Protestant church of to-day is to build it singly, honestly, and skilfully for its tenants and their special requirements. Servile copyism can only lead to failure.

To quote from another: "There is every reason why our churches should be fitted for the destined use. It is not enough that they can be used, in spite of their inconvenience, for Protestant worship; they should be its visible counterpart and reflection. The great charm of good architecture everywhere lies in this, — that it expresses the aims and feelings of its founders; that centuries after they have passed away, it is still alive with their life, and every stone of it tells, in a universal language, what they loved, what they believed, and what they sought; . . . . can any one say that modern religious architecture is in like manner the reflex of modern religious thought? and can any one who thinks Protestantism worth living for, say why it should be unable to produce churches distinctively its own?"

J. A. F.

THE ILLUSTRATIONS.

THE HOLYOKE OPERA HOUSE, HOLYOKE, MASS. MR. C. S. LUCE, ARCHITECT, BOSTON.

THIS building was completed in March, 1878, at a cost of about $40,000. It measures 90 × 114 feet, and has a seating capacity of 1040. Built of brick and stone, with brick partition walls and four auditorium exits and two stage exits, an audience is perfectly secure, in case of fire. The acoustic properties are all that could be desired, and the width of the proscenium arch secures good points of sight throughout the house. All the appointments, scenery, stage contrivances, traps, and gas are of such a nature as to admit of the production of the most elaborate piece. The difference of architectural style in the exterior and interior is accounted for by the fact that the building is one of a group (published in the *American Architect*, March 16, 1878, and here shown by a smaller reproduction), and the exterior was influenced by the other building, which was commenced before the Opera House project had assumed form.

DESIGN FOR THE COMPLETION OF THE WASHINGTON MONUMENT. MR. H. R. SEARLE, ARCHITECT, WASHINGTON.

The base of the monument would be formed of three unequal pyramidal terraces, the lower one 20 feet high and 40 feet wide on the top; the second one 24 feet high and 30 feet wide; the third 30 feet high and 24 feet wide; the face of each terrace would be on a different angle, formed by a line from the under side of the cornice at the top of the shaft, touching the upper corner of the terrace, and extending down to the next level. The length of each front of the lower terrace would be about 250 feet. Above the upper terrace is a casing around the present shaft, four feet in thickness and 40 feet high. Above this again, at a proper distance, is a cornice above which the shaft is divided by deep grooves into what might be termed three pilasters, which extend up to the capital. This capital, including all its members, is 38 feet high, and has as a member a large flat cove 17 feet high, which is foliated, — the originals for the foliage being natural plants of the country. The upper member of this capital forms a balustrade. Above this the shaft finishes to a point, in the form of a pyramid, in overlapping sections, making the whole height of the monument, from the ground to the top, 530 feet. The face of the terraces at the

base would be built of buttresses of massive blocks of rock-faced granite, in courses about four feet high each; between these buttresses are sandstone panels 20 feet by 12 feet, on which may be cut in the future bas-reliefs, illustrating scenes in the life of Washington. On the upper terrace, facing east, would be a colossal statue of Washington, about 22 feet in height. Over each buttress in the face of the terraces the cornice carries a post or pedestal, the corner ones being from eight to six feet square, the larger ones on the lower terrace and the smaller on the upper one; and on these corner pedestals it is designed to place colossal groups of statuary. The other pedestals could be used for single statues. The top of each terrace would be formed by means of heavy wrought-iron girders and brick arches. The lower portion of the walls of the second and third terraces would offer thousands of superficial feet for tablets, grouping of tombs, and memorials of men and deeds connected with the past and future of this nation. The ventilation of this interior would be provided for by the hollow casing of the shaft above the upper terrace, in the cornice of which would be openings for the escape of air; ingress to the interior of the terraces would be had by a doorway under the first flight of steps. On the inside of the shaft would be an iron stairway composed of straight runs, and to every four flights, making a rise of about 50 feet, would be a gallery entirely around the inside of the shaft. In the well could be placed two steam elevators. The upper portion of the interior of the shaft would be lighted by windows, which would be placed in the channels before described as dividing the shaft into three pilasters.

HOUSE FOR PROFESSOR SLOANE, PRINCETON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PRINCETON, N. J.

This house is built of a local stone. Tiles are inserted in the gables.

CORRESPONDENCE.

ST. ALBAN'S CATHEDRAL.

London.

The Abbey — now Cathedral — Church of St. Alban's is fast becoming as famous in the present as it was wont to be in the past ages of its history. After a long interregnum of quietness it has suddenly burst into notoriety again. The reason is one which has before now wakened up many a slumbering, not to say mouldering old pile, the bogey restoration! It is being restored, — that is enough to waken up anything, even the original designers themselves, and all the host of fellows who have tampered with it since.

For the benefit of such of our readers as have not the advantage of a personal knowledge of the famous old church, it may not be out of place to give a brief description of its present condition.

It is a very old place; commenced by Abbot Paul, of Caen, at the end of the eleventh century, with bricks and tiles from the old Roman city of Verulam, it has been added to and altered in nearly every age since, till it presents a medley of all styles and modes of building, scarcely any of which can fairly claim the highest rank as examples of their respective dates. There are some notable exceptions to this, of course; it would be very surprising if there were not; but such is about the rule throughout, and the result is a building more interesting from an historical or archæological, than from an architectural point of view; not that there is by any means little for the architect to study; on the contrary, the place is a perfect mine of information of all sorts and dates. Under the hands of its numerous builders, St. Alban's has been so spun out that it has the reputation at least of being, with the single exception of Winchester, the longest church in England, some five hundred and fifty feet from east to west, though we are afraid it must be added that it is about the plainest of the great churches bequeathed to us from the Middle Ages.

To begin at the west end, it has an abnormally long nave (this time *the* longest in England), with side aisles, approached by triple porches in the west wall, of which the central one only is open, the side ones being at present blocked up from the outside.

The nave has thirteen bays, four of which on the north side (shown in the view published in your issue of 29th June last) and five on the south side, are Early English; five more on the south side are Decorated, or Middle Pointed; the rest are Norman of the plainest possible type. Then we have the central tower, the transepts, and the choir of five bays, with its side aisles. These central parts are the most ancient, the choir having been reconstructed, however, in the fourteenth century. Its three westernmost bays are devoted to the choir proper; the remaining couple of bays eastward, and separated from the others by a magnificent fifteenth century screen, are called the "Saint's Chapel," from the shrine of St. Alban erected here. The high altar is placed against the western side of the screen just mentioned. To the eastward of the Saint's Chapel, and opening from it by three pointed arches (now walled up), is the lady-chapel, with its ante-chapel, built during the fourteenth century: thus far in the way of the plan.

Externally it presents a monotonous appearance, long and low, relieved only by the mass of the grand old central tower, but having few or no architectural features of any great merit. The walls are of brick and tiles, or stone and flint, according to the dates of their construction. The windows generally are poor in design, those of the Norman period being simply holes in the brickwork; the tracery of the later work is generally weak in detail.

The original high-pitched roofs are all gone, and the structure has the appearance of being roofless. The parapets are built of brick of the commonest description, and the west front is in the most wretched condition. Of its three portals, which Sir G. G. Scott declared must have been amongst the most perfect work of their kind in England, the central only is open, but in a half-ruined state. Above is a great fifteenth century window filling the whole breadth of the nave. It has been proposed to restore this front as a memorial to Sir Gilbert Scott, and certainly it is high time something was done. Almost anything would be better than its present condition a standing disgrace to all connected with the historic old church.

The central tower is a splendid piece of old brickwork; perhaps it is more building than architecture, so little is there of the beauty of ornament about it. It is grand from its mass, and interesting from its age. It is said to have been surmounted in the thirteenth century by an octagonal lantern of timber, and it is mooted that this feature may yet be replaced.

Internally, the central and oldest parts of the church are plain, even to baldness; the bricks are covered with cement which has once been highly decorated in colors. Indeed, the glory of St. Alban's seems to have been its colored interior. Many interesting pictures and patches of decoration have been reclaimed from beneath the whitewash; columns, walls, and arches, all seem to have been painted, and, to judge from what remains, very well painted too. The thirteenth and fourteenth century bays of the nave are very good, with some excellent detail in the triforia. The nave and transepts have flat ceilings covered with decoration, said to have been painted in the fifteenth century or thereabouts, in imitation of much older work. Whether this is so or not, the whole affair is most execrable, both in design and color, utterly unworthy all the fuss that has lately been made over it. The choir is groined in wood, with fourteenth century painted decoration of considerable interest. The lady-chapel and ante-chapel are good fourteenth century work, and present many pleasing features; but they are all under repair, and, when the walled-up arches leading from the choir are opened out again, will afford one of the best views in the interior.

There are several very fine monuments, particularly in the Saint's Chapel, in the centre of which, on its old site, stands what remains of St. Alban's shrine, re-erected in the most skilful manner by Sir Gilbert Scott, from the fragments found in the building. It must have been a most magnificent work of art, as also the shrine of his friend and fellow-martyr, Amphibalus, the remains of which stand in the centre of the ante-chapel. To the north of St. Alban's shrine is a splendid watching-loft, of great interest, both from its design and execution.

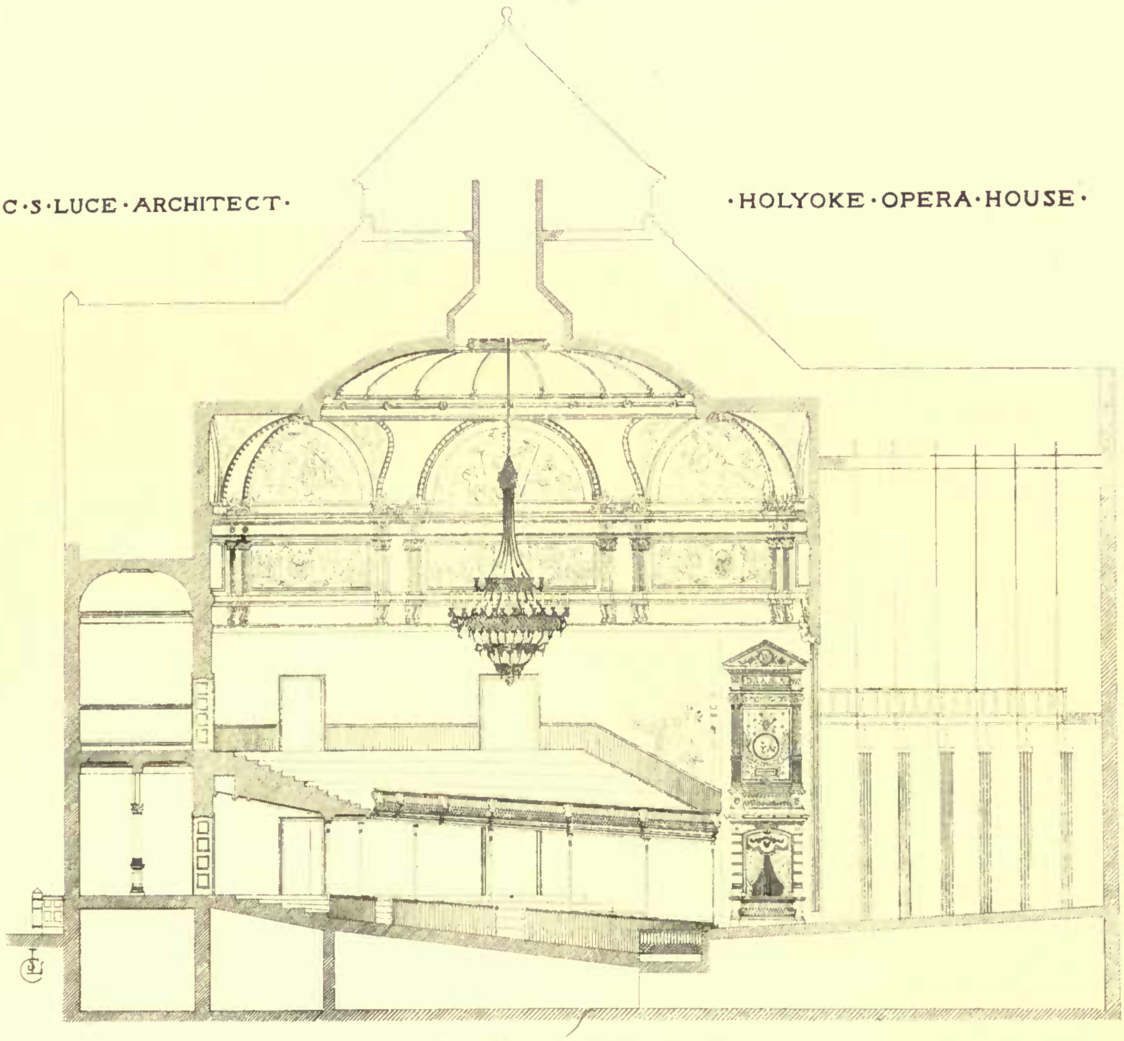
Such is a brief outline of the church as it at present exists. Now let us see what has been done and what is proposed in the way of so-called restoration.

Passing over the work of Mr. Cottingham in the south transept, etc., about the year 1832, we come to the first work of Sir Gilbert Scott, some thirty years later, and find that he materially improved the north side, re-roofed the north aisle, and restored the buttresses of the choir aisle; he also cleaned off the plaster-work from the outside of the tower, and had the brickwork pointed down. Then the choir paving and steps were renewed, the north transept roof and ceiling repaired, and an ancient doorway and superstructure rebuilt in the choir from the fragments found in a Norman doorway in the wall. The central portions of the church having been thus put in order, Sir Gilbert then undertook the restoration of the western portion of the nave, and particularly the straightening up of the Early English piers and clerestory on the south side, which had got some foot or so out of the perpendicular. This was effected with the greatest skill, and the restoration of the north and south clerestories, as well as the parapets of this portion, has also been finished. It must be presumed Sir Gilbert had good authority for all he has done here in the way of rebuilding; but if the corbel-table of the parapet is taken from an old one, it must have been of very poor character. It is Early English in design, but looks exceedingly weak in detail, as seen from below. The work on the clerestories and parapets seems to be finished for the present, and ends where the thirteenth century work joins on to the Norman on the north and the Decorated on the south side. The south aisle for a corresponding length has also been repaired, new buttresses built, and covered with a high, sloping roof. Internally, this portion of the aisle is now being vaulted in stone. The clerestory walls and parapets are of stone; but the aisle walling and buttresses are faced with flint, having stone finish. The old public passage-way through the ante-chapel has been stopped up, thus restoring the lady-chapel to the interior. Both chapels are now undergoing most extensive repairs, of which it is almost too early to speak.

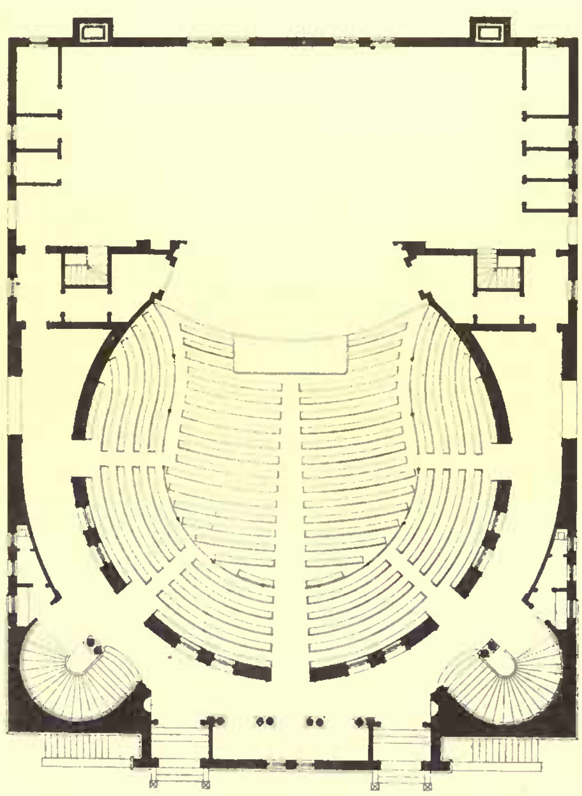
Thus far the work had progressed when the death of Sir Gilbert Scott deprived St. Alban's of the most skilful architect and careful restorer it had seen for many a long year. Probably no one will contend that everything he did was just right and no more. It is an old story now with what bitter opposition his work was received by the anti-restorationists, more particularly, perhaps, his treatment of the tower in clearing away the plaster from the face of the brickwork; how they contrived to worry him, and how bravely he defended what had been done; that is all as nothing compared to the storm

·C·S·LUCE·ARCHITECT·

·HOLYOKE·OPERA·HOUSE·

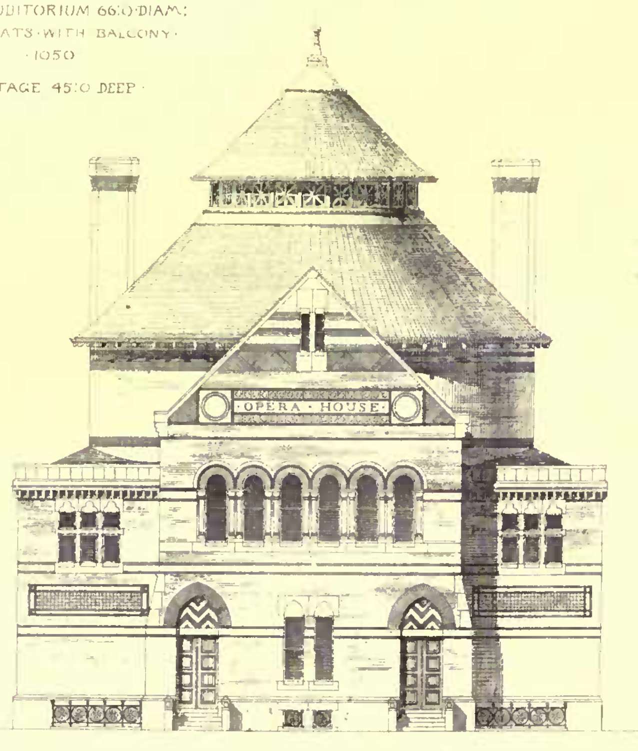


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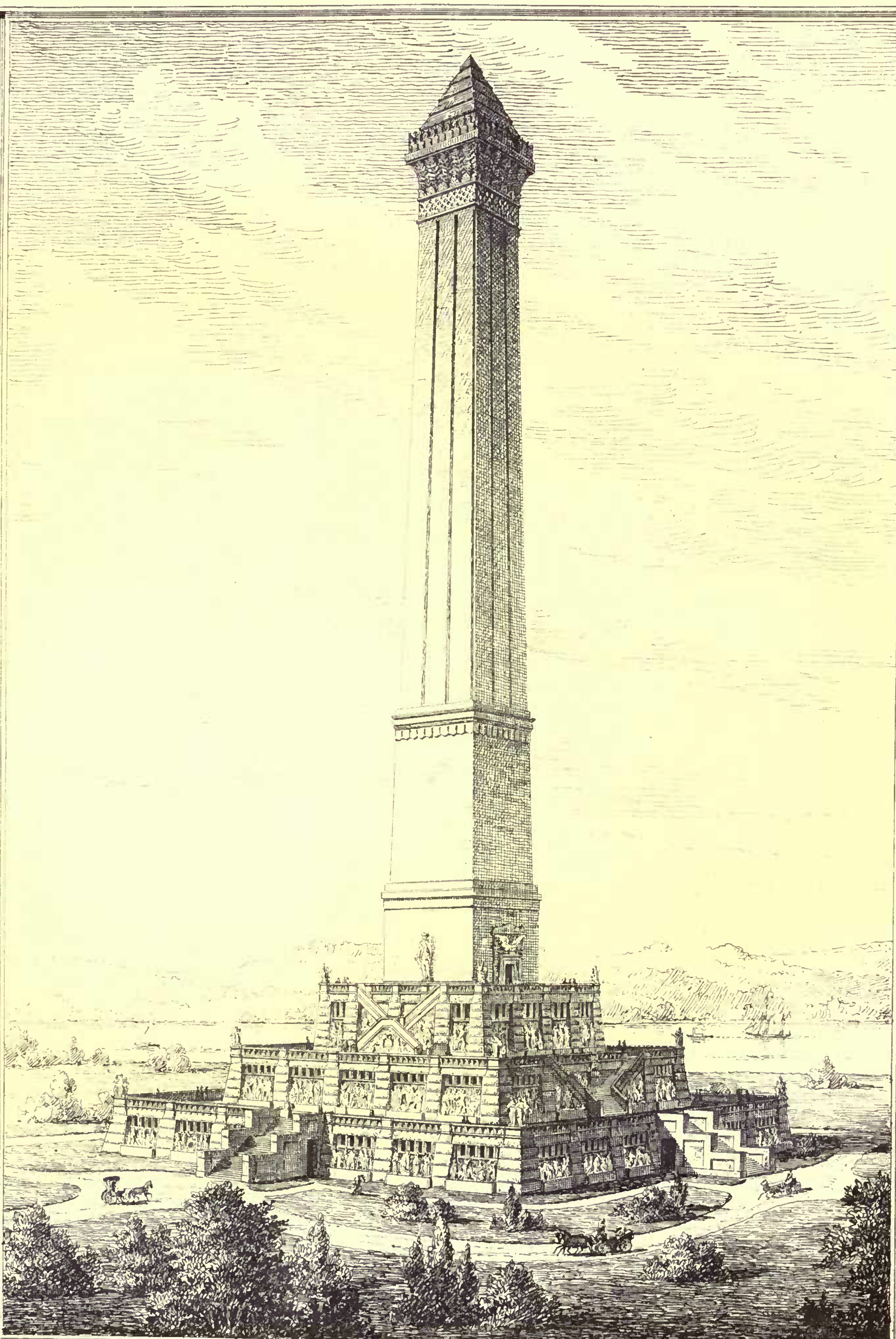
·PRINCIPAL·STORY·

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·1050
·STAGE 45'0" DEEP·



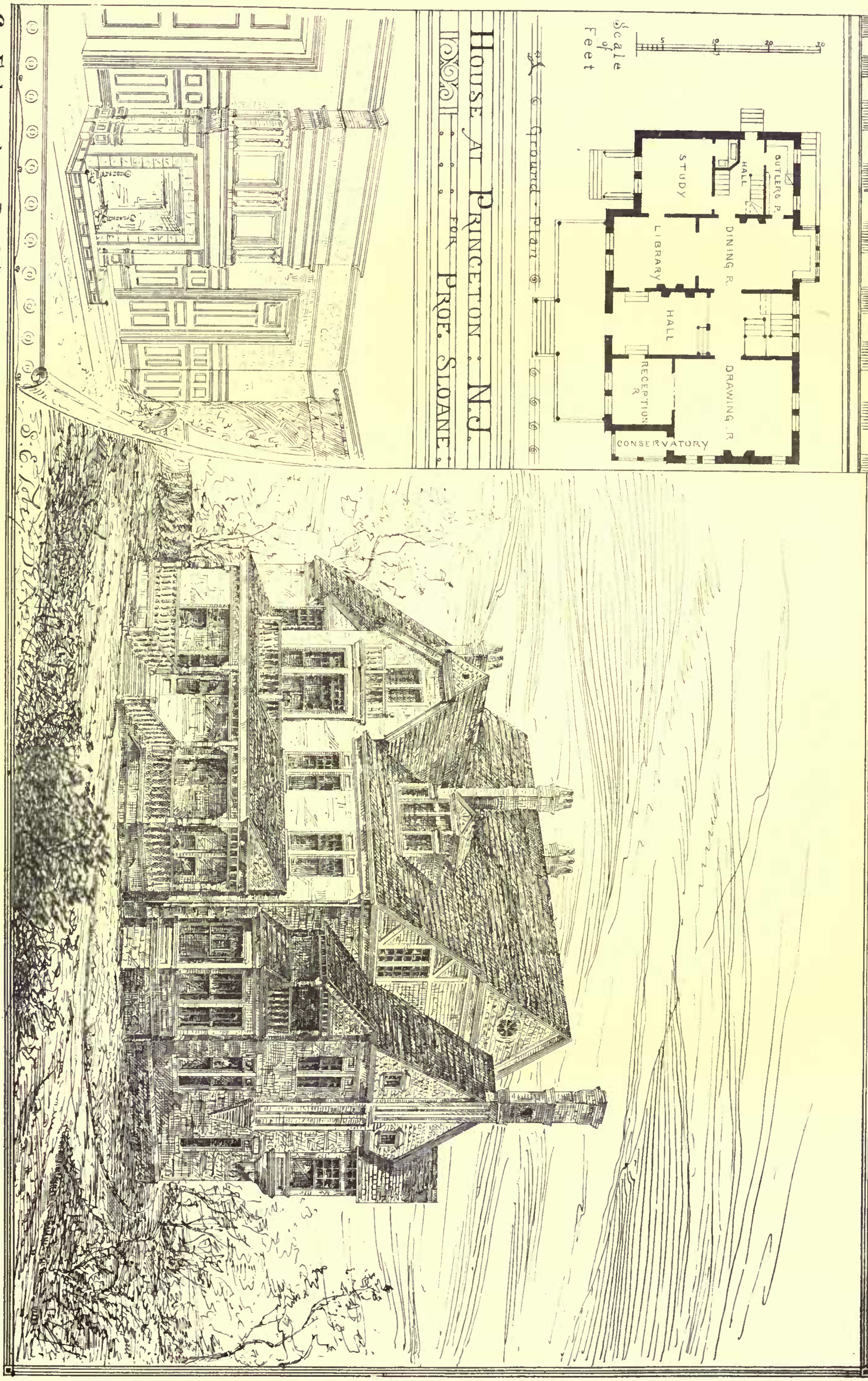
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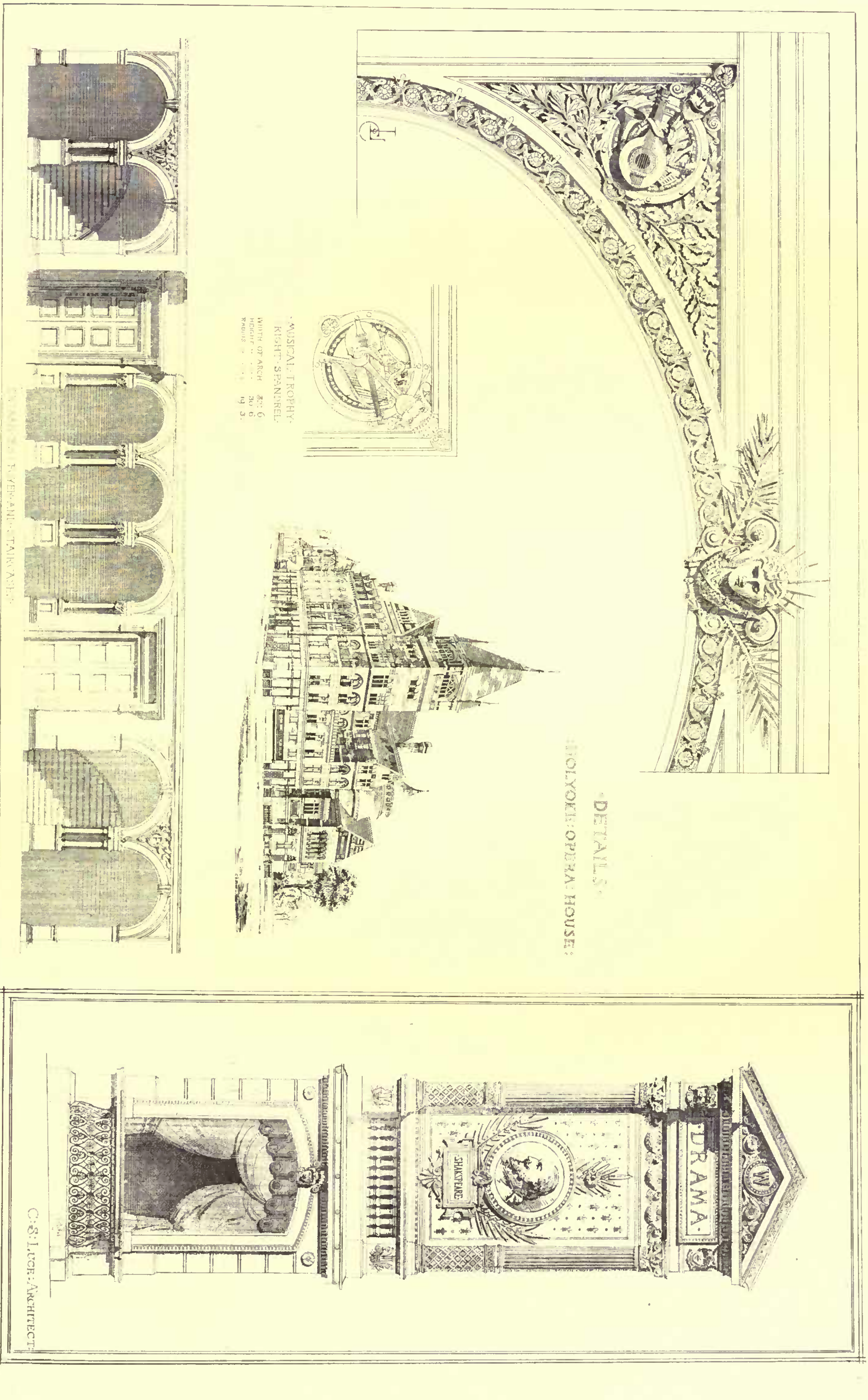
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House at Princeton, N.J.
for
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Ground Plan
Scale of Feet
5
10
20
30
STUDY
HALL
BUTLERS P.
DINING R.
LIBRARY
HALL
DRAWING R.
RECEPTION R
CONSERVATORY
C. Edwards. Archt.



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that has arisen since. The weight of his name and high reputation as an architect generally managed to keep things working smoothly; but no sooner is he in his grave and the work he left unfinished consigned to the hands of his sons, George Gilbert and John Oldrid Scott, and their first new proposal made known, than the whole world of amateurs, antiquaries, and, we are sorry to add, some leading members of their own profession, are up in arms, and a controversy has been raging for months past, and all about what? A proposal to cover the nave of St. Alban's with a high-pitched roof! The subscribers and their committees held meetings, discussed and re-discussed the subject, and finally upheld the designs of their architects. The Society of Antiquaries and the Institute of British Architects took it up, sent down representatives to inspect, made reports, and held more meetings. Amateurs and everybody who thought he had a word to say about the matter rushed into print, wrote letters to the *Times*, and more letters to the professional journals; it has even got the length of the quarterlies; straws were split on what the exact pitch of the old roof must have been; hot arguments were urged for and against the question of the parapets. The grand old tower would be shorn of its noble proportions. If the nave gets a high roof it must have a new western gable, and the transepts must follow suit. The beautiful (!) old painted ceiling would be sacrificed, the whole church utterly spoiled, and so on *ad infinitum.* Now, apart from the archæological questions of whether there were ever two steep roofs over the nave or only one, and the exact pitches thereof, the greater question remains behind, What will be the effect of the high roof on the general design of the cathedral? If any unprejudiced person will go down to St. Alban's and carefully study the matter on the spot, we humbly think he can come to but one conclusion, namely, that artistically speaking it would really be a vast improvement. If there is one church more than another which needs height, it is St. Alban's. It is all low and squat, and lacking the dignity the additional height would give it. This particularly applies to the west end, which sadly needs the gable it once possessed. What then becomes of all the talk of spoiling the church and destroying the proportions of the tower? The original design had a high-pitched roof, so either the authors of it knew what they were about or they did not, and presuming (as we have a right to do) that they did, then the church they designed for a high roof must be held to be incomplete without such a feature, and the tower against which it abutted can never present the proportions originally intended until the roof is there again. Whether the new roof comes down with eaves on to a corbel-table, or finishes behind a parapet, is after all really a secondary matter. The parapets are there now, and we have seen high-pitched roofs behind parapets before this without thinking the combination a monstrosity, besides which they help the needed height of the walls. Then as regards the interior, the flat roof itself, as far as its timbers are concerned, is nothing very remarkable after all. As for the painted ceiling, which it has now been decided to retain, anything more utterly vulgar and commonplace can hardly be conceived. It has been taken down from the western half of the nave, now under repair, and the effect of the open roof timbers, as seen from below, is worth acres of the bedaubed boards which covered them up from view.

That it became necessary in some measure to appease the opposition to the new roof by making a compromise to retain this wretched ceiling is a most melancholy instance of misguided artistic philanthropy, — a great cry over very little wool.

If a high-pitched roof would be a manifest improvement to St. Alban's, and even Mr. Street is understood to admit this much, why should it not have one? Can any one declare, who has seen it, that to rescue the west front, with its three beautiful porches, from its present disgraceful condition, would be an artistic crime? Or is it that the architects are unequal to the task? No one has ever hinted at such a thing. It is very well known that Sir Gilbert's sons, by both training and natural gifts, stand in the front rank among the artists of their profession.

Restoration or rebuilding, call it which you like, has been the rule, rather than otherwise, at St. Alban's all its days; the mediæval builders here as elsewhere showed their usual disregard for the work of their immediate predecessors. They pulled down, added to, or altered, as seemed right in their own eyes, in the most unscrupulous fashion. What did John de Cella care for the old Norman west front he pulled down to make way for his Early English façade? or what again mattered de Cella's work to Trumpington when his innings came? Just nothing at all, if it did not suit their purpose; and yet there is a general outcry because two highly-accomplished artists propose to give St. Alban's back its high-pitched roof, and replace the hideous brickwork of its west front with a decent elevation, while restoring its ruined porches. Surely they had, at all events, a right to expect their professional brethren would not interfere with their clients and try to thwart their intentions by something which looks very like an attempt to coerce them into an opposite course of action. The Anti-Restoration Society, with its crowd of noisy amateurs, might go so far, or even farther; but it comes with rather a bad grace from architects with whom restoration forms no inconsiderable part of their practice. Depend upon it, the fuss has been altogether overdone. It is time the dispute over the true pitch of the old roof should cease, as it is fast becoming neither a very edifying nor a very creditable spectacle, and that the whole matter should be allowed to settle itself; the work could not be in better hands, even if they were Mr. Street's or Mr. Neale's.

THE TENEMENT-HOUSE COMPETITION.

NEW YORK.

THE past few weeks have been rich in exhibitions of various kinds. The water-color exhibition at the Academy of Design is especially interesting this year, and the exhibition of works in black and white at Kurtz's Gallery is a very good one. But the one that has the greatest interest for the architectural mind is the exhibition of the drawings of the competition for a model tenement-house, of which the *American Architect* has already given some account.

It is easy to see that many of the drawings, a majority, perhaps, are the work of inexperienced or immature designers; but in spite of that, the drawings as a whole are interesting, and there is no question that the organizers of the scheme have been doing an excellent work and deserve the thanks, not only of the profession, but of the public at large. Our present tenement system is known to be a disgrace to the community, and any steps towards freeing us from the evils of the past deserves encouragement, — and this competition will place before the public many of the data necessary to intelligent action in the construction of future tenements. Landlords will learn not only how they can improve on the methods now in vogue, but about how much they will have to spend on such improvements, besides many interesting details of arrangement, construction, ventilation, or plumbing.

The conditions being extremely limited, the different designs necessarily fall into three or four categories, and there is very little work outside of these categories worthy of being considered. These categories are, roughly: 1st. Building over the entire lot (except a small yard at the rear) and depending for light and ventilation of inner rooms and stairs on wells or shafts.

2d. Leaving a narrow alley on one side and getting light and air from this alley.

3d. Having suites of rooms front and back, with stairs in the centre and a court each side of stairs.

4th. Having an area or court at one side, with stairs in the centre of the building and open to the air, and access to the suites either by open-air galleries or by an interior corridor.

There are a few good plans that do not fall into one or another of these divisions.

We might mention one *Nutshell* who seems to have an excellent idea not sufficiently developed, and puts the staircase between two courts not opposite each other. Had the staircase been made open to the air, thus connecting the two courts, it would have given a disposition very favorable for light, ventilation, and privacy of suites with publicity of entrance.

All plans giving less than four suites to a floor it seems safe to discard, also all plans with more than one staircase. But beyond this point it is very difficult to decide, for it becomes a question of compromise between the natural desire of the landlord to utilize and make rentable the space, and his humanity and consideration for the welfare of his tenants. How many square feet of land can we reasonably ask the landlord to turn into court, or what is to him waste space? According as this question is answered by the committee will the awards be given in one or the other of the above-named categories. To us it seems unquestionable that the fourth category, with side area, open staircase, galleries of communication and an entrance from the street which cannot be closed with solid doors, offers the greatest advantage to the landlord that is compatible with a proper regard for the tenants.

Among the plans that seem to be carefully and intelligently worked out we noticed *Lux*, with square court in centre, and stairs connecting with suites by means of bridges. The plumbing and ventilating seemed well considered.

Octagon, with stairs in centre and area each side, one run of stairs takes one to the level of first floor rear, next run to first floor front, and so on, each pair of suites thus having a landing to themselves.

Your kind consideration, No. 6. Excellent plan, side court, central stairs, and good arrangements in detail.

Pro bono publico, No. 57. Well studied, but not air and light enough. Would recommend itself more strongly to the owner than to the tenant.

Pro bono publico, No. 16. *The Poor.*

All the above mentioned have points of excellence. B. W.

NEW WORK. — MR. HATFIELD'S DEATH. — THE STEWART MEMORIAL CATHEDRAL.

NEW YORK.

THE dulness and stagnation which for so many seasons past have prevailed in the offices of the architects here seem to be passing away, and in not a few places visited brisk activity and hurry show the preparation for spring. There are few large commissions to be given out, but with the talk of building on all sides, and the few important buildings which must fall into somebody's hands for design, the outlook is undoubtedly improving. In the city there is a large building trade, with very little of architecture about it. The rapid transit extension to the upper river limit of the city has brought into possible use a great tract of territory, and speculators and builders are in a ferment to get it covered. Tenement houses are being rushed up, here and there an apartment house, with just enough of those conveniences for housekeeping *en suite* to justify the name,

while in many places the oft-repeated demand for small, single tenant houses has led owners to build some houses of this grade.

The "plum" of the opening season has been the house about to be built for Cornelius Vanderbilt, on the northwest corner of Fifty-seventh Street and Fifth Avenue. This has fallen to Mr. G. B. Post, after a lively competition, in which several of our prominent architects took part. Messrs. Harney, Clinton, Snook, and Hatch, were in it, with perhaps a few others, but the last man in proved to be the first man out, and Mr. Post again comes to the front with a design which he will no doubt make over and over again, until the completed building and the winning competition design possess only the most general resemblance. His Historical Society building in Brooklyn is pushing on, and Boston is furnishing some very ambitious details in terra-cotta, after his designs.

The coming events which are casting their shadows with more or less distinctness before are, 1st, the Club House for the Union League Club, that body having resolved to leave the old Jerome mansion, at Twenty-sixth Street and Madison Avenue, and move up on Fifth Avenue into a grand club house to be built on a piece of leased land; and 2d, the new Chamber of Commerce building, which is to go upon the site of the old Post Office, on Nassau Street. A bill before Congress authorizing the transfer stands a fair prospect of a passage, and the chamber is ready to go to work at once on its long cherished plan of piling up a great Exchange in the business heart of the city. With the sweeping away of the old Dutch Church, the metropolis will lose one of its few ante-revolutionary buildings, but modern New York will get another great pile of architectural pretension and perhaps of artistic merit.

A sad event of the week has been the death of Mr. R. G. Hatfield, whose passing away was as sudden as it was generally regretted by his brothers in the profession. His death leaves an important vacancy on the committee at present busied on the examination of the plans sent in for the tenement-house competition. Mr. Hatfield had been laboring very busily at this, and it may have in some measure hastened his demise, through his over-anxiety to do the most conscientious work. Mr. Renwick, it is believed, will take his place on the committee. There seems little prospect now that any decision will be reached by the committee of award until March, and it may be possibly the middle of that month before the name of the successful architect is made known.

One of the most interesting buildings now going up under the direction of a New York architect is the Stewart Memorial Church, at Garden City, which Mr. H. G. Harrison is carrying out in an old-fashioned, painstaking way, designing everything by his own hand. One corner of his atelier has the look of a pottery, in its masses of wet modelling clay, where busy artists build up gargoyles and groups of foliage, finials, and bosses. Already several cart-loads of models tell of his diligence; but in the free luxuriance of Gothic forms there are thousands of opportunities for the modeller's skill and taste. When $75,000 can be spent on a single room in material and labor, some notion may be formed of the character of the work on the building as a whole. The pavement of the church is to be of polished marble, principally of imported varieties, while the slender metal columns are soon to have their casing of real bronze, inlaid or pointed with gold, thus making, certainly, a unique and brilliant finish and securing to every worshipper on the floor a view of the altar. The capitals are to be of bronze, as well. The work about the chancel is to be of the richest. There will be sixteen sedilia or seats about the chancel, while out in the choir will be additional accommodation, giving the cathedral, if need be, the opportunity for the most sumptuous ecclesiastical displays. The whole structure, when finished, would need a volume to describe it; and Judge Hilton will leave his work but half completed if he fails to publish an illustrated monograph on the building. Then, instead of being the ornament of an unpicturesque Long Island hamlet, the Stewart Memorial Cathedral, with its crypt, the finest in America, will become a work of art known through two continents. W.

ENGLISH AND CONTINENTAL ART.

The Paris Universal Exhibition of 1878 has left, in many respects, a more definite and decided impression on the public mind of the cultivated world than that of 1867. It is not too much to say, that for the first time in the history of the world we are able to observe the formation of a cosmopolitan public opinion in matters of art. Previous universal exhibitions had not produced this result. They had led rather to a sense of the incompatibility of national opinions. In 1855 English painting had been regarded, not only by Parisians, but by other Continental visitors, as a singular curiosity, intensely interesting as a manifestation of insular peculiarity; and Englishmen wandered amongst Continental pictures with a strong sense of their entirely foreign character. In the London Exhibition of 1862, and at Paris in 1867, this feeling of exceeding strangeness had in part passed away, but it had not yet given place to any cordial international interchange of opinion out of which a cosmopolitan public opinion might take its rise. In 1867 the feeling in Paris about English art was mainly one of disappointment. The first freshness of sensation occasioned by mere novelty had passed away. English painters were no longer looked upon as highly interesting barbarians; but, on the other hand, Continental criticism had not yet begun to feel any real sympathy for English art. Our own countrymen did not feel themselves in such a strange world amongst Continental pictures as in 1855; they had become familiar with Continental art in the interval; but still the sentiment of nationality was too powerful to be overcome by any broader and more tolerant sentiment. In 1878 two changes in public opinion have been distinctly visible. The first is, that people of different nations often had the same opinions about the schools of Europe; or in other words, that a public international opinion formed itself; and the second is, that the differences of nationality have not produced any sentiment of narrow-minded disdain, but rather a desire to preserve them as sources of freshness and variety, which are very likely to be lost in a near future. The difference between French opinion of English art twenty years ago and now is that the French used to laugh at our painting for its eccentricity, whereas now they think it desirable that its originality should be preserved; and the best Continental criticism generally has become so much more tolerant and enlightened, that the old prejudice against English art, once universal, not only in France, but all over the Continent of Europe, has given way to a respectful interest, and, in many cases, to a hearty approbation. English painters, on their part, have undoubtedly, as a body, made an advance in the direction of what is good in the Continental schools, and that without sacrificing their special superiorities. Their painting is much less crude and glaring than it used to be, but it is still as interesting as ever it was in subject and invention. The cosmopolitan opinion, which has been formed during the Exhibition of 1878, has been so decidedly favorable to English painting, that we hope to see English pictures admitted into Continental galleries much more generally than the old prejudice against them ever permitted in past times. It is not too much to say that a few years ago a traveller might visit nearly all the public and private galleries of the Continent without seeing a single English picture. Our present impression is that English painters have done well to learn what they have learned from their Continental contemporaries, but that the movement has gone far enough in that direction; and that the important matter now is to keep what is best in their own nationality. There still remain in France some survivors of the old school of criticism, to whom English art can never be much better than a barbarian invader, a Vandal within the walls of the Eternal City, and M. Charles Blanc is one of them. "Every island," he says, "is an individual on the globe, and its isolation prevents it from being familiarized with general ideas, and from being accessible to the sentiment of generic forms, two things which are essentially Continental." Now we venture to observe that although Great Britain is an island geographically, it is really less an island intellectually than France is. An Englishman is not very accessible to foreign ideas, and he seldom knows a foreign language well; but he is somewhat less shut up in his own nationality than a Frenchman. M. Charles Blanc affirms that "style" can never be insular. It is curious at this time of day to hear an old gentleman gravely discoursing about such an exploded superstition as *le style*, the old set recipe for painting Raphaelesque works, and Michaelangelesque works, without the genius of Raphael and Michael Angelo. Style, in its true and living sense, is very various, and exists abundantly amongst the better painters of the English school. It is really nothing but idealization, without which art falls to the ground at once, and becomes mere colored photography; but as artists are differently constituted, their ideals are different. For example, M. Charles Blanc was himself greatly struck by Mr. Burne Jones's picture of "Merlin and Vivien." "*Il y a là*," he says, "*une quintessence d'idéal, une poésie sublime qui m'apprehende au cœur. La Viviane du peintre semble évoquée par une sorte d'incantation: on dirait d'une figure de Mantegna qui serait retouchée et amoureusement enveloppée par le pinceau d'un Prud'hon, Le spectateur est séduit par la charmeuse, et c'est elle qui enchante l'enchanteur.*" In other words, the French critic is delighted with the English painter's style, though, as it is not the regular classicism of the drawing-school, he does not call it style, but *poésie sublime* and *quintessence d'idéal*. Again, he admits that there are *beaux portraits* in the English school, as if it were possible to produce a *beau portrait* without style. So narrow is M. Charles Blanc's view of the subject that he denies style to Rembrandt and Rubens, who, however, "replaced it by genius."

True style is individual, and it was interesting in the Paris Exhibition to see how many forms it assumed. It seems to us very desirable that this variety should be preserved; so desirable, indeed, that although the style of Mr. Burne Jones did not enchant us so much as it enchanted M. Charles Blanc, we should be sorry to see him sacrifice his individuality. His art is, as all art should be, a real emanation from his mind, and yet at the same time its strong personality includes what seem to us to be two errors or affectations, the wilful choice of morbid complexions and countenances, and the preference of bad form to good because it looks more original. There can be no necessity to give everybody a pale face and a goitred neck. Even Vivien, though her face is pretty, is not really a good figure, as we should see more plainly if she were undraped. The coloring of the picture is sickly throughout; but this, we presume, is part of the intention, as Merlin himself is like one dying under the spell of the enchantress. It was a curious result of the greater sobriety of recent painters that the works of John Lewis seemed strangely crude in this exhibition, whereas ten years and twenty years ago this had been much less visible. The fine qualities of the "Courtyard of a Coptic Patriarch" still held their own, but the "Commentator on

the Koran" and the "Midday Meal" suggested a wish that the painter had not introduced so many colors, the raw blue-greens being especially objectionable. Mr. Millais had a very important exhibition, occupying nearly the whole of one wall. It is scarcely possible for the same person to like all Mr. Millais's pictures equally, simply because he is an artist of wide range; but they are always interesting. The artist was, in fact, his own rival, as the author of "Waverley" is the dangerous rival of the "Last Minstrel." Judges equally competent preferred one or another of Millais's pictures, but all agreed in considering his exhibition interesting and important, and the broad result of it is a great extension of his Continental reputation. The "Beefeater" was wonderfully popular, and so were the little girls, the "Sisters." Of the two landscapes, "Over the Hills and Far Away" was, we believe, generally preferred to "Chill October," partly on account of the monotony of the reedy foreground in the latter, though Continental critics were of course astonished by the (perfectly true) intensity of the Highland color in "Over the Hills."

The contrast between English and Italian painting was strongly felt by every one. The English seem to have happily got out of the crude stage; the Italians are in it, and in the very middle of it. It is almost incredible that the modern Italian painters inhabit the country which owes half its fame to illustrious masters of past times, but the truth is that they have begun, to borrow Emerson's phrase, "with no past at their back." Finding nothing in the old art corresponding with their modern needs, they have begun the whole art again from nature; and crudity is an inevitable consequence of this. After the first shock of astonishment at a kind of painting which sets the teeth on edge, we discover considerable keenness of observation and lightness of touch; in short, the qualities which help a young artist to make minutely faithful studies. In some of the Italian painters, in Michetti, for example, there is what seems at first sight an intolerable and unpardonable affectation; but it may be that the painter has been aiming at certain visual results, which are not to be attained in the ordinary, straightforward manner of painting. The early manner of De Nittis was a good example of what modern Italian methods can do to render the truth of nature; but his more recently developed style of painting is much less minutely curious, and betrays rather the desire to get the work finished and have done with it, than the delicate caressing of a favorite subject. His color, too, which in dealing with Southern sunshine was fresh and clear, is now purposely dirtied in dealing with London. Of all the Italian painters, the least offensive, either through glare or by dulness, was certainly Pasini; but he was familiar to us already, and the prevailing tendencies of the present Italian school were not so familiar. It is passing through an unpleasant youthful phase at present, and especially lacks the mellowness of ripened art; but if we take it for what it really is, — a new school born on old ground, and not a degenerate old school, for it is not that, — we shall see reasons to be hopeful. There is every probability that modern Italian painting will come to good, in due course of time.

The influence of French painters on other Continental schools is remarkable, but no artists have felt it more, for good or for evil, than the Americans. As represented at the Paris Exhibition they were, with few exceptions, little more than an additional regiment belonging obviously to the great French army of artists.[1] This is the more to be regretted that the Americans are now, as a body, quite sufficiently well educated in art to go on without the help of foreign instruction. There ought, of course, to be good public galleries in America, but with those, and a sound system of instruction in the United States themselves, it is probable that a really original American school would very soon form itself and gain a fresh strength of its own quite independently of Europe.

We have not space to speak of sculpture; and the English school holds so poor a rank in Europe that it is not an encouraging subject. France, by Governmental encouragement and natural talent, holds easily the first place. As for Italy, we can only regret that the patronage of buyers has turned naturally able men into a false direction, making them nothing but amusing and dexterous carvers, and not sculptors in the higher sense. One general observation strikes us, and that is the extreme difficulty of carrying art into really new directions. There were scarcely more than two or three real novelties in the whole exhibition, such as the vulgar pictures of Verlat and some Italian crudities, for Fortuny and his school have no longer novelty to recommend them. The moral is, that if we are to enjoy art at all, in these days, it must be simply by finding our pleasure in what is good, without seeking for new sensations. — *P. G. Hamerton, in the Portfolio.*

[1] They deserve, of course, much more detailed mention than this brief allusion, many of them being really excellent painters, and the present writer hopes to do them better justice in the *International Review.*

TWO POPULAR ARCHITECTS.

[We print the essential parts of a letter concerning two architects who have lately died in New York. It was written for another use, but will be of interest to our readers.]

I AM inclined to give Mr. Thomas more credit for public-spirited intentions than has been sometimes given. I had a conversation with him two or three years ago, in which he showed a good deal of what seemed to me to be sincere feeling on the subject of the influence he had exerted, or supposed himself to have exerted, on the public taste. He overrated immensely the value of popular criticism on current art, and accepted without reserve his success in "getting orders from the most respectable and solid members of the community," as the test of artistic success; but his citations, arguments, and whole manner betokened a genuine conviction that his labors had been altogether on the side of, in his eyes, "the finest architecture the world has ever produced," namely, the Renaissance. He contrasted his productions with the street façades of forty years ago with some vehemence, but with no small degree of discrimination; while he evidently appreciated and keenly felt the inroads on his prestige of the rising generation of trained architects. At the same time, he showed less bitterness than might have been expected, and I got the impression that, though he felt his only safety was in the grammar of the Renaissance, he recognized the merits of "advanced work," and was not altogether blind to the beauties of even "Queen Anne." On the whole, I can readily believe what I have heard since his death, that it was not only the tragical end of his two sons, and only children, but this appreciation of his waning professional popularity, which largely contributed to the shadow over his later years.

I may add, with reference to the juxtaposition, which I have seen, of Mr. Thomas's name with that of another prominent practitioner whom a portion of the public agreed to adopt as an architect, that so far as their productions, and the influence of those productions on the public taste, are concerned, it seems fair enough to class Mr. Thomas and Mr. Kellum together; but so far as each in his functions as an architect was concerned, I should myself feel disposed to give much the higher rank to the former. Mr. Thomas himself designed what he built, or if he could not, with his extensive practice, find time to inspire the production of all the detail, he was capable of doing so, and probably, in his oversight of his assistants' drawing-boards, virtually did design most of what bore his name, — whatever that was worth in either fees or fame. On the other hand, Mr. Kellum — to whom as a boy, he being still a journeyman carpenter, though even then a gray-haired man, I used, at his solicitation, to teach the difference between (*e. g*) a Roman and a mediæval arch, or a Doric and an Ionic column — did not know how to handle a pencil with less than say a half-inch breadth of lead, was entirely dependent on his assistants for design as well as draughtsmanship, and never, I think, for a moment regarded his latter-day vocation as other than a trade by which to make money — particularly where large iron contracts were concerned — out of wealthy people who fancied themselves architectural amateurs, and found comfort in playing the *rôle* of art-patron to one whose mental and educational equipments, being inferior to their own, prevented any jar to their *amour propre.* Nevertheless, in several of the last conversations I had with him, when he was, for the second time, after a lapse of years, knocking very hard at the doors of the Institute of Architects for admission, I found him as regards the more prominent of his city buildings, by no means averse to appropriating all the glory he could command. But even this, it struck me, arose rather from a perception of the money value of professional reputation than from a genuine pride in it, *per se.* A. J. B.

PUBLICATIONS RECEIVED.

ANNUAL REPORT OF THE MINISTER OF PUBLIC WORKS for the fiscal year, 1st July, 1877, to 30th June, 1878, on the works under his control. Submitted in accordance with the provisions of the Act Thirty-first, Victoria, Chapter Twelve, Section Nineteen. Printed by order of the House of Commons, Ottawa, 1879.

THE TRANSACTIONS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS FOR 1878–79. Six numbers, containing: 1. Opening Address by Charles Barry, F. S. A., President; 2. The High Sanctuary at Jerusalem, by Claude R. Conder, Lieutenant R. E; 3. Discussion on Lieutenant Conder's Paper; 4. Remains of Buildings in Midian, by Captain R. F. Burton; 5. Discussion on Captain Burton's Paper; also, The Modern Restaurant, by Thomas Verity, Fellow; 6. Notes on St. Paul's Cathedral, by F. C. Penrose, M. A., Past Vice-President.

NOTES OF EXPERIENCE AND INEXPERIENCE.

3. FURNACE HOT-AIR PIPES — Give the cold air in your exposed room a chance to escape, so that there will be room for the hot air to enter and refill, and not use radiation of hot air only from register as at present, after the air within the room is warmed, for if the room is full of air, it can't, by its own force, be made any fuller. Put a cold air escape as near the floor as possible and connect the same with some smoke flue.

EXPERIENCE.

3. FURNACE HOT-AIR PIPES. — I notice one of your correspondents requests information on the subject of hot-air furnaces. There is but one way possible to draw his heat to the exposure quoted. If he can devise such ventilating flue in said room as will secure him a positive exhaust, he can warm the room, when the direction of the wind is not against him.

J. H. STEDMAN.

3. FURNACE HOT-AIR PIPES. — The case mentioned by "Hot Air" in the *American Architect* for February 15 is a hard one to deal with. It is very difficult to force hot air from a furnace into an exposed room on the northwest of a house when the wind blows from that quarter, as it always does in the coldest weather. The only way to ensure it is to make it easier for the air to reach the room by placing the furnace as nearly under it or by providing larger or straighter pipes than to the other rooms; and this is a thing

to be always taken into account in fixing the position of a furnace and in arranging the hot-air pipes. If the current to the room will maintain itself it may of course be established by temporarily closing the other registers, and opening the door of the room will probably favor it. If there is any considerable rise in the pipe the current may be assisted by cutting a door into the bottom of it and setting in a lighted lamp till the room gets warm. To introduce the screw (unless with a motive power, like a fan) would only make matters worse, for there is nothing but the ascending current to give motion to the screw, which therefore is only an obstruction. The Archimedean or screw ventilator is a contrivance that does no great honor to its godfather. The wind which turns the revolving cap, and by that the screw, would ordinarily have more effect in increasing the draught by simple friction across the open chimney-top. If there is no wind, the apparatus is a mere obstacle to the rising air, which not only has to force its way up, but is obliged to turn the screw in order to get out. As a protection against down-draughts it is inferior to a cowl; without a wind the theory on which it ventilates is that on which a man lifts himself by the straps of his boots. P. L.

4. Chimney Flues. — "Tyro" will find that to secure a good draught the chimney should be of sufficient size, should be carried up above surrounding objects, should be as straight as possible throughout its length, and should be as smooth as possible inside, to avoid friction. As a draught is caused by unequal temperatures, the chimney should be so arranged as to avoid a rapid radiation of heat. If in an exterior wall there should be at least eight inches of brickwork between the flue and the exterior surface. For country houses it is much better to have the chimneys run up through the interior, as the flue is more easily kept warm, and the heat that is radiated helps to warm the house. The most frequent cause of a "smoky chimney" is the insufficient size of the flue for the grate or fireplace connected therewith. The flue should not be less than one eighth the capacity of the square of the width and height of the grate or fireplace. That is, if the grate has a front opening 20 inches wide and 26 inches high, the flue should be 8 in. x 8 in.; or, with an opening 36 inches wide, and 32 inches high, the flue should be 12 in. x 12 in.; and, to get the best result, the opening into the flue from the grate or fireplace should be of a less number of square inches than the square of the flue, and never larger, as no more air should be admitted at the inlet than can be carried through the flue. Where there is more than one inlet to the same flue, the sum of all the inlets should not more than equal the size of the flue. A number of stoves may be connected with the same flue, one above another, if this rule is observed. A *square* flue is better than a narrow one, as in two flues containing the same number of square inches, the square flue would have the smallest amount of wall-surface, and consequently less friction for the ascending currents, and less absorption of heat by the walls. Chimneys should be closely built, having no cracks nor openings through which external air may be drawn to weaken the draught. If they could be made throughout their length as impervious to air as a tube of glass, with interior surface as smooth, one cause of smoky chimneys would be removed. A downward current of air is frequently caused by some contiguous object higher than the chimney, against which the wind strikes. This higher object may sometimes be quite a distance from the chimney, and still affect it badly. A good chimney-top constructed to prevent a down draught will remedy this difficulty. Each grate or fireplace should have a flue to itself. Under very favorable conditions, two grates or fireplaces might be connected with the same flue, but it is not a good plan. We have known grates and fireplaces connected with two flues, where they have been built under a window for instance, and, owing to there being insufficient room for a flue of suitable size, a flue has been run up on each side of the window. This is a very bad plan, and never can work well; it requires too much heat to warm both flues, and if the room in which the grate or fireplace is situated should be pretty close, so that there was no other entrance for air, there is danger that it would circulate down one flue and up the other, forcing smoke out of the fireplace into the room. W. H. Jackson & Co.

8. Stucco-Work Moulds. — What proportion of beeswax and resin do I want to use to make moulds for moulding stucco-work, and what kinds? If there is any other ingredient, please inform me in your column of experience, etc., and oblige, "Stucco."

9. Old Materials. — What is the accepted usage as to the disposal of old materials in a case of repairs and alterations? Do they belong to the proprietor of the building or to the builder making the repairs? Does a clause in a specification directing the builder to use in the new building such portions of the old as may prove suitable, constitute him the owner of the old material not so used? Rubbish.

NOTES AND CLIPPINGS.

The Saratoga Monument. — In our issue for November 3, 1877, we commented on the design of the monument which the Saratoga Monument Association proposes to build to commemorate the surrender of Burgoyne's army. We do not know just what progress has been made, and possibly nothing more than the laying of the corner-stone, in October, 1877, has been accomplished. At all events, interest in the project languishes, and the society is in need of funds to carry out its undertaking, and has at length been driven to adopt the plan of petitioning the legislatures of the thirteen original States for an appropriation of one thousand dollars from each. The legislatures have taken as yet no definite steps, but it is understood that those of Connecticut, Rhode Island, and South Carolina are willing to make the appropriation asked for.

The "Builder" and its Editor. — In the last number of the *Builder* Mr. George Godwin, its editor, in speaking of the coincidence of the number of the journal with that of the present year, says, "Of those 1879 weekly numbers which constitute the present life of the *Builder*, 1781 have been produced and issued under the direct personal care and supervision of the present conductor." Those who are familiar with the *Builder*, and at the same time have any inkling of the complex and multifarious duties which devolve upon an editor, can best realize how ably the onerous task has been discharged.

Rocking Piers. — A novel construction has been recently described in *Engineering* as having been employed in the Dysdale Viaduct, on the railroad from Christiania and Fredrikshald, carrying a single rail over the Dyse brook. These rocking piers for viaducts are intended to protect the structure from the effects of expansion and contraction, due to alterations of temperature. The piers which support the superstructure are of wrought-iron, with lattice-work webs. In the longitudinal direction of the viaduct, which is some 603 feet in length, there is only a single column between each span, possessing no stability in itself, and the upper end is allowed to move along with the superstructure when the latter expands and contracts. The lower end of each pier rests on a hinged shoe, so that breaking strains are avoided, and the load is always rendered central to the pier columns. The movement of iron work in a longitudinal direction is transferred to one abutment on which are the necessary bed plates, provided with rollers; on the other the superstructure is kept in place by a fixed shoe. With this arrangement, it is stated that no special expansion-joint in the rails is necessary, as the sleepers and platforms are quite independent of the expansion and contraction of the ironwork.

A New Tunnel. — A despatch from Geneva says that the contractor for the St. Gothard Railway tunnel is treating with a group of French financiers to pierce the Simplon.

The German National Monument. — The *Academy* says that the Munich Foundry has been entrusted with the casting of the German National Monument, which is to be erected in the Niederwald, close to Bingen on the Rhine. The monument has been designed by Professor Schilling, of Dresden. On a pedestal, twenty-four metres high, is to stand a figure of Germania pointing with uplifted hand to the symbol of German unity, the imperial crown. The figure, which is to be thirty metres high, is considered a triumph of German plastic art. The model is to be carried shortly to Munich, and will there be put together for casting. The cost of the monument will amount to 1,100,000 marks, which has been provided for, save a balance of 350,000 marks, which is to be gathered by a special collection made in each German town.

The Beacon of Lavezzi. — "The Beacon of Lavezzi," says the London *Times*, "which stands near the middle of the Straits of Bonifacio, between Corsica and Sardinia, has a curious history. There is here a very dangerous submarine rock reaching from about two metres below the surface down to six metres; its form is, roughly, that of a truncated cylinder. There being no tides in the Mediterranean, this rock of Lavezzi is never uncovered. (The island of Lavezzi is a little to the north.) In 1855 a frigate, La Semillante, carrying troops from Toulon to the Crimea, was wrecked here in a violent storm, and not one of the 743 souls on board was saved. An obelisk on the island commemorates the event. Previously a light-house had been erected by the Sardinian Government on the island of Razzoli, which is a few kilometres E. S. E. of the rock. After the catastrophe a huge iron buoy was stationed at the rock, carrying a strong bronze bell, and a pyramid with six mirrors to reflect the rays of the sun and neighboring light-houses. Sometimes the roar of the waves even drowned the bell; and in one storm the buoy was wrecked on the rock which it was placed to warn against. It was resolved to raise a beacon on the rock, and this was done in 1869, a foundation of beton having been fixed in position with the aid of a caisson, and reaching a little above the surface. A system of lighting the locality, soon after adopted by the Italian and French Governments, was of the following character: The Razzoli light-house was arranged to throw a beam of red light (having an angle of 7 degrees) towards the Lavezzi beacon, *i. e.*, westwards, while another light-house on the south of the island of Lavezzi threw southward towards the beacon a sector of red light of 80 degrees (it threw at the same time a green sector northwards on rocks near Corsica). Thus, after March, 1874, mariners knew that so long as they saw both light-houses giving white light they were sufficiently clear of the rock; but whenever both gave red they were in its immediate neighborhood. Victory seemed complete till in 1875, after a severe storm, it was seen with dismay that the beacon was gone. A buoy was temporarily put in position, and reconstruction was soon proceeded with, but in a new way. It was decided to have a beton base strengthened with iron bars penetrating the rock. The beton was built up by divers round 12 iron pipes placed vertically on the rock, and through these pipes the boring tools were passed into the rock, penetrating to a depth of one metre. The mason divers generally remained down about two hours, and they were armed with bronze poniards (steel being corroded by sea water) against sharks and gigantic cephalopods which haunt that region. The holes having been bored, thick iron bars were introduced and cemented, penetrating the rock on the one hand, and the beton on the other. The tower built on the foundation thus acquired was finished on the 14th of September, 1877. It rises seven metres above the water, and is painted with horizontal bands of black and red alternately, which is understood to indicate that ships may pass on either side. It has a balustrade on the top to afford refuge in case of shipwreck, which will now, it is hoped, be rare."

The Virtue of a Water-Seal Trap. — Mr. James Mactear, says Mr. W. P. Buchan, sanitary engineer, has been making careful experiments with water-seal traps, at the St. Rollox Chemical Works, England, of which he is the managing partner. He has found no difficulty in getting gases to pass through the water, but has failed up to this time in all attempts to cause ferment germs to pass through the water. This difference in viability of the gaseous and germ molecules is attributed to the greater size of the latter, which are thereby disenabled from passing between the spaces formed between the molecules of water. At any rate these experiments seem to show that, after all, there may possibly be more protection in a water-seal trap than is usually believed nowadays.

A Brick-Lined Tank. — The *Metal Worker* says that some years since Professor Chandler, President of the New York Board of Health, built a tank which was not only serviceable but cheap. He had made of stout plank a large box carefully braced, and lined it with bricks each one of which was dipped in melted coal-tar just before it was laid in place, the coal-tar serving instead of mortar. A thin coat of this substance was spread over the inside, which made the tank thoroughly water-tight.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, MARCH 8, 1879.

CONTENTS.

THE question of tenement houses has been growing upon the people of New York, till it has become the prominent social topic of the hour. Many meetings and addresses have been given to it since the clergy of the city set apart their special Sunday for its discussion, and the interest aroused in it led to a mass meeting, which was held a week ago at the Cooper Institute, to set going a movement for reform. The meeting was very large and earnest; the mayor presided, and the list of men of marked public and social influence among the vice-presidents and secretaries showed that the movement was taken up by those who were best able to devise and execute a reform, so far as one is practicable. What means will be found we have yet to see. The speaker who offered distinct suggestions of what could be done was Mr. Joseph H. Choate, who suggested that two hundred men should give five hundred dollars each, or half as many a thousand each, to build a model tenement house, after the example of Mr. Peabody in London, arguing that the only way to a successful reform was in showing "that tenement houses can be built good enough for any man to live in, rented at low prices, and yet money be made," and so by competition compelling the builders of the common tenement houses to raise their standard. The statistics given out in this and other meetings set forth the need in an impressive light. It is declared that half a million people in New York, half the city population, live in these houses, of which there are twenty thousand, large and small, in the city, and that in some districts as many as eight hundred people live on an acre of ground. The hope has been held out that the elevated railroads will tend, by making it easy for workmen to get back and forth, to tempt their families away from the crowded points of the city, but we doubt whether this will accomplish much in the face of the tendency of poor people to crowd together. The only real hope of amelioration seems to be, as Mr. Choate argued, in example and competition, and the question is, Will capitalists enough be found who will so place their money and take such pains as to make their competition effective?

As we go to press we learn that the committee of award in the tenement house competition instituted by the *Plumber and Sanitary Engineer* has adjudged the prizes as follows: First prize, $250, to Mr. James E. Ware, New York. Motto, "Light, Air, and Health. C." Second prize, $125, to Mr. Henry Palmer, New York. Motto, "Kensington." Third prize, $75, to Messrs. D. & J. Jardine, New York. Motto, "*Ut Prosim.*" Fourth prize, $50, to Mr. William Kuhles, New York. Motto, "Peter Cooper."

IN June of last year, and in answer to the appeal of Mr. Eads for relief from the terms of his contract for the jetties at the South Pass of the Mississippi, Congress passed a bill, which, authorizing the payment of the second million of dollars under the contract, in advance of the stipulated conditions, directed the appointment of a special board of army engineers to examine the condition of the jetties, and report upon their progress; the probable cost of completing them; the results which have already been obtained by them, and those which may be expected o follow; the probable permanency of the works; and a visability of any modification of Mr. Eads's contract, whether touching the dimensions of the channel required, or the terms of payment. This board, consisting of Gens. Barnard, Macomb, Tower, and Wright, and Col. Merrill, convened in last December, and having made its examination of the jetties in January, at the end of that month rendered its report to the Secretary of War. From the report, which our readers will find given almost in full in the March number of *Van Nostrand's Engineering Magazine*, we extract the main conclusions. The contract on the part of the Government, we will remind our readers, was provisional, Mr. Eads, or the South Pass Jetties Company, which he represents, being required to do the work at their own risk, no payments becoming due until the depth of the channel had increased to twenty feet (from nine on the bar before the work began), and an additional payment being then made for every two feet gained, the full amount of five and a quarter millions being paid only on condition that the depth of thirty feet on which Mr. Eads counted should be secured and maintained for twenty years, over a channel of three hundred feet wide.

IN regard to the progress of the work, the Board reports that of the twelve thousand feet (nearly) on the east side, and eight thousand on the west, which were the originally intended lengths of the jetties, all but about three hundred feet on each side has been laid and brought up once to the level of high water, a cross dam, the so-called Kipp-dam at the head of the pass, being also built, to narrow the pass to the desired width of seven hundred feet between the jetties. Brought up *once*, we say, because from compression and the natural settlement of the soft bottom under the weight, which indeed was expected, there has been a subsidence, increasing toward the seaward ends, so that the last fifteen hundred feet or so of both jetties are overflowed at high tide, the extremities being some three and a half feet under water, while the shore ends are a foot or a foot and a half above it. On account of the great increase of this subsidence on the soft material of the bar, the ends of the jetties, which were to have been carried well over the bar, have been stopped, as we just mentioned, the eastern on the crest and the western two hundred feet short of it. The jetties are built, substantially like the Dutch dikes, of alternate layers of willow fascines or "mattresses," and of stone or gravel, the whole resting on a broad foundation of mattresses. When finished they are to be covered with a rounded paving of rip-rap stone, the outer quarter of a mile being finished with a concrete capping in large blocks, and a thousand feet within this being protected by a low crowning-wall of rubble masonry. Besides the jetties themselves there are several temporary lateral dams and two permanent "training walls" to deflect the current among the shoals at the head of the pass into the desired channel; and "mattress-sills," as they are called, that is, courses of mattresses loaded with stones, have been sunk across the heads of the southwest and southeast passes, to diminish the escape of water through them. In these various works there had been consumed, up to November 1, 1878, 452,000 cubic yards of mattresses, and 65,000 yards of stone, mostly small stone. For the completion of the work so undertaken, Mr. Eads's estimate is three hundred and fifty thousand dollars, nearly, and the Board thinks this likely to suffice if no extraordinary contingencies occur. Of the permanency of the works the Board is hopeful, notwithstanding the fears that have been expressed of danger from the sea, from decay, and from the *teredo*. The injuries of the teredo are likely, the report says, to be confined to the exterior of the mattress courses at the outer ends of the jetties, while the condition and construction of the work makes it reasonably secure against the other dangers; but there will doubtless be occasion for more or less renewal of height to make up for the subsidence that must continue for the present, — how long, the Board does not venture to estimate.

FOR the results of the work thus far the Board reports that, although the maximum depth on the bar had been reached in December, 1877, when it was 23.7 feet, and from this it had in December, 1878, diminished to twenty-three feet, there had been on the whole a "constant progressive general improvement in the jettied channel." There has been, during the year, a general increment in depth of about two feet for the last mile of the channel and more, giving twenty-four feet of water for the whole distance, except for about sixty feet at the crest of the bar

(whereas before the jetties were built the water shoaled to about nine feet for the last half mile), and affording a channel width of two hundred feet throughout, and three hundred for most of the way. The depth of twenty-five feet extends almost as far, and makes almost as wide a channel as the twenty-four foot depth, and there is twenty-six feet for all but about a thousand feet in length. The scouring action on the shoals at the head of the pass has apparently been somewhat diminished by the works below. The depth of water, which was originally fourteen or fifteen feet, has been increased to twenty-two; but the bank between the depths of twenty-four feet, above and below, has increased during the past year from three hundred and fifty feet wide to eight hundred, the greater part of the increase being down stream. This the engineers mention as an unfavorable result. Mr. Eads's hope of counteracting it is in raising the sill of the Southwest Pass by additional mattresses; but that this measure alone will prove sufficient, the engineers have not, they say, full confidence.

OF the results to be expected in future the report speaks encouragingly, though probably less encouragingly than Mr. Eads would wish. The full effect of the jetties has not yet been shown, because in their incomplete condition there is a great escape over and through them of water whose scouring effect is needed in the channel. Captain Brown, in one of his official reports, has estimated this waste at twenty per cent of the whole flow into the pass. Mr. Corthell, the engineer in charge, estimates it at twenty-five per cent. The immediate effect of some of the works at Grand Bayou, and above the pass, has been to diminish the water that enters by ten or twelve per cent. With the restoration of the flow and the completion of the jetties, the board thinks there is reason to expect that a channel of twenty-five or twenty-six feet may be maintained; they do not see reason to look for the attainment of the thirty-foot channel anticipated by Mr. Eads and the engineers who first reported in favor of his project. It has been argued not only that the natural advance of the bars will make it necessary to add to the length of the jetties from time to time, say once in ten years, but that the jetties themselves will accelerate this advance. On this point the Board reports that, so far as observation has yet shown, the effect of the jetties is really to retard if not to check the advance. Finally, in answer to Mr. Eads's appeal for a modification of his contract, and for an acceleration of payments, the Board decides that it is premature to recommend as yet any changes in the dimensions of the channel required, or any further immediate payment; but it advises an advance of a quarter of a million of dollars for carrying on the work, and suggests that, in view of the real benefit to commerce of every foot gained in depth of channel, a change be made in the conditions of payment so as to allow an additional sum for every single foot gained, instead of every two feet.

ONE can almost fancy the long-suffering Chicago Court House, — if it ever finds itself finished, of which there seems now to be a chance, — asking itself, like the good old woman in the nursery tale, if this be really I. The divided dome having been at last suppressed by the triumphant city, and the foundation which the county had laid for it having been pulled away with cost, the "rotunda," which was to have taken its place being also done away with, and the cross-building which was to have carried it having sunk into a mere gallery connecting the two wings, there was not much left to do in the way of razeeing. The municipal tinker has just given the last snip to the petticoat by passing, in concurrence with the county, a resolution that the height of the connecting arcade shall be reduced, omitting everything above the arcade itself; that then the entablatures and rear walls of the wings above the arcade shall be finished separately, to avoid emphasizing the conflict in color of the two kinds of stone of which they are built; that the caryatids, and sculptures of the attic shall be replaced by pilasters; and, as we are told, that the top of the balustrade (meaning, we suppose, the balustrade itself), shall be omitted and its base retained as a blocking course. There remains to be decided the question of what material shall be the arcade which is to connect and harmonize these two wings of discordant color. It is expected, they tell us, that red sandstone will be chosen. This, as a medium of reconciliation between two buildings, one of a yellow-white stone and the other bluish white, and thus a pledge of harmony between town and county, is greatly to be admired.

DURING the past week the papers have given accounts of three casualties which will illustrate in three different ways the recklessness of danger to life and property with which our people do their mechanical work and carry on their vocations. The first is the fall of one span, a hundred feet long, of a railroad bridge, under an empty train. Happily no lives were lost, and so there will be no public inquiring to point the lesson of the disaster, an immunity which is due only to the fact that the bridge did not hold out long enough for the next loaded train to get upon it. The second occurred in Stockton, Cal., where some two hundred persons had gathered in the street to watch the working of a new steam pump, run by an old engine. The steam-gauge was out of order, and the engineer, having screwed down his safety-valve, went on with his work, till the boiler exploded with a force that drove it through the crowd of people like a catapult, killing twenty-six of them and injuring many. The engineer, who was punished for his exploit by being blown to pieces, is said to have answered, when some one remonstrated against his use of his machine, that it "would either work or burst." The third case, and not the least painful of its kind, was the burning of a stable in New York, by which fifty horses were burned at once. The stable was in the heart of the fashionable quarter of New York, and surrounded by costly houses, and yet was built, as stables usually are, so as to be a mere fire-trap. The floors were of wood, of course; the horses were in the basement and in the second story, the ground-floor between being used for carriages. Runways of plank led up and down, for the horses to ascend and descend by, screened off from the rooms and from the wooden stairs by simple board partitions. The building burned very rapidly, and it was found impossible to do anything with the horses, which broke loose and rushed over each other in ungovernable terror. The doors were opened, and an iron lifting-gate which closed the entrance was raised, in the hope that some of the horses, at least, would find their way out; but the ropes that held the gate soon burned off, and it fell, and there was no escape. The disheartening reflection is that there are probably hundreds of such bridges all over the country, waiting their turn to fall; thousands of such unsafe engines, controlled — or uncontrolled — by such incompetent engineers; thousands of stables equally inflammable, likely any night to burn themselves and their contents. We do not know whether underwriters are in the habit of insuring horses against fire; if they are, we may presume that their premiums are high.

ARCHITECTURAL STUDENTS.

METHODS OF STUDY.

THE letter from "Young Architect," which we print on another page, asks questions which are often asked, but are not very easy to answer in a way to satisfy the inquirers, chiefly because nobody has undertaken the labor of making provision for such cases as his. There is no such thing as an English architectural curriculum. There has never been even a serious attempt in England to establish an architectural school of any importance, we believe; certainly no such school exists. The American schools have arranged for themselves such courses of study as they found practicable, their efficacy depending more on the knowledge and judgment of their instructors than on any text-books or systematic arrangement of appliances for study that could be prescribed for solitary students. There is not in our language any series of books that can be warmly recommended as text-books for architectural students; nor has anybody, as far as we know, been at the pains to select and classify such examples, or to provide such illustrations of them as should lead them through their preliminary studies.

This necessarily makes progress difficult to students who try, by private study, to train themselves beyond the point to which their office experience would bring them, and makes the course of the solitary student a peculiarly perplexing one. To prescribe a course of private study which shall be satisfactorily direct and efficient, orderly and comprehensive enough, would be a pretty difficult task, and would require a good deal of thought. When it was done it would probably look somewhat discouraging to a beginner, for a good knowledge of architecture is not to be had without long and hard work, any more than a good knowledge of any other profession. But something may be said by persons who have considered the question of architectural education which will be a help at starting to those who are struggling at a disadvantage, as every one is who is trying to fit himself for a profession without regular tuition. We hope that

some of our readers who are better qualified to advise than we may have something to say in answer to our correspondent's questions; meanwhile we will call his attention to a series of articles addressed to architectural students, which we published in various numbers of this journal, from September, 1876, to March, 1877, of which the most apposite to our present questions are Nos. IV., V., VII., and VIII.; and will offer some further suggestions which seem to us likely to be of use to many students.

Let us say in the first place that most of them need to be told how to study quite as much as what to select for their studies. Though there is a great choice in what they shall read, it is still more important how they will read it, — using "read" in a sense broad enough to include their study of illustrations as well as of books. Before we venture to offer a list of books to be read (which shall not be very long), except so far as they may suggest themselves in illustration of our discussion, we will say a word as to the way in which they should be used, and concerning general methods of study. And we will risk the repetition of some things upon which we have touched before, because they will be clearer for further illustration and because they cannot, we think, be kept too prominently in mind by the learner.

The pencil (or the brush) is the architect's chief educational reliance, not merely for learning to draw, but for all his after study. Just as the literary worker makes notes of what he reads, pen in hand, for use in his work; so the architectural student should constantly make sketches not only of what he sees about him, but of whatever is illustrated in the books he reads. This is his means at once of training his sense of form and proportion, of storing his memory with forms, and of learning to think architecturally. It is not enough, then, that he uses his pencil sufficiently to become, as our correspondent says, a fair draughtsman; he must use it incessantly as his means of study till it becomes his ready instrument of thought. Let him read, then, with his pencil and paper beside him, and make it his habit to draw or sketch constantly whatever he finds that is most interesting in his illustrations. When he has not time to draw, he can trace, which is also serviceable, but he had better be in the habit of drawing, and especially of sketching from memory, the parts of his illustrations which he thinks most valuable, and omitting the rest, — only being very careful of two things, that he does not lose himself in details when it is really the general aspect of a whole that attracts him, and that he corrects his sketches or memoranda by after reference to the originals. He ought to make up his mind to a great deal of this sort of work, the more the better, so long as he does not allow himself to do it carelessly, and when he has acquired the habit of it, he will find material everywhere. It will be of the greatest service in strengthening the faculty, perhaps more important to him than any one other, of discriminating just what it is that gives to what he sees its interest and value, and of winnowing it from what he does not want. The things that he only sees will make a certain impression on his mind, but to remember them with precision or analyze them with certainty he must draw them. In doing so he will see many qualities in them that otherwise would escape even a careful examination, and if he draws from memory, as he should constantly, he will soon recognize the difference between a loose knowledge and an accurate and serviceable one. And if skill in the use of his pencil is necessary for these things, it is yet more necessary when it comes to giving shape to his own ideas. If an architect is to do his designing himself, and not by deputy, he must have actual skill in determining and expressing beauty of form and proportion, and for acquiring these no other means is worth a rush. We take frequent occasion to insist on this doctrine, because though it may be taken for granted as a theory, it is greatly neglected among us in practice. One of the reasons of the inferiority of American architecture is that its designers lack, not the ability to make a sufficiently creditable sketch or drawing of their work, but the sensitive eye of the really skilful draughtsman.

As soon as possible he should emancipate himself from dependence on scales and T-squares, and train himself to make sure of his proportions by the help of the eye alone. We say, by the eye alone. This is a point of the very first importance, not only at this stage of his work, but at every subsequent stage, and more than all when it comes to designing. Until the architect's command of proportions and adjustments is absolutely independent of scale and measure he cannot design with freedom and power, but is always in trammels. The writer of this article remembers being urged by the first architect with whom he studied, before there were any architectural schools in the country, to get the habit as soon as possible of working by scale. He did so, and it was some years before he recovered the ground lost by too implicitly following this counsel, which cut him off from acquiring the firmness of judgment and security of proportion that come with a well-trained eye. Drawings which are made for service, and finished designs, must of course be drawn accurately to scale. The architect, in translating his designs, so to speak, for execution, must be able to think in accurate dimensions, must know the effect of feet and inches and quarters of inches in the executed work, and must be able to take these things into account in learning the practical lessons of actual examples. But he should cultivate from the beginning the power of perceiving and fixing the proportions of his design by the relations of parts to each other, without dependence on actual magnitude, and of adjusting them by his own perception without mechanical aids. We have heard it said of no less a musician than Schumann that he injured his power of composition, or at least the freedom of his conception, by his habit of composing at the piano; the architect who cannot conceive and sketch his design securely without the help of scales and modules is like the musician who cannot compose away from his instrument.

It is well that the student should adopt one special procedure, to be fixed in his mind as a habit and followed wherever it is possible in all his future work. That is, he should not build up his drawing or his design by piecing one thing on to another; but should lay out at once his gross dimensions, and then divide and subdivide, proceeding always from the greater to the less. Thus in setting out his order he should first fix the whole height, then divide it into column and entablature; then the entablature into its cornice, frieze, and architrave, the column into shaft, base, and capital, and then subdivide these into their proper mouldings. The same proceeding should be followed in all his drawing or subsequent designing, whether done by the eye or by measurement, — first the mass, then the division, then the subdivision, and last the detail, each being made sure before the next is touched. Such a habit will have a greater influence on the student's mind and work than he could anticipate. It is too apt to be passed over as if it were merely a matter of the convenience of the moment, but it really affects the whole mental growth of the designer. It will be likely to lead to all the difference between a mind that is attentive to the broad relations of things, and therefore has the power of combination, subordination, and proportion, and one which is at the mercy of its detail.

The student will soon find, in fact, what everybody who has had occasion to supervise young draughtsmen has had reason to notice, that it is not safe, even for accuracy, to lay out so much as a group of mouldings by piecing one member upon another successively, and that if he does so, the accumulation of imperceptible errors will probably end in throwing the whole out of relation. He will gradually make the discovery that though measures are most accurate for considerable magnitudes and single dimensions, there are many cases, especially in grouping of members and in defining forms, where the trained eye is much more trustworthy, and must be on the watch to correct the instrument. The reason is simply that while the compasses can take account only of absolute dimensions, the eye perceives relations, which are more important. We have sometimes found it almost an impossibility to open the eyes of a draughtsman to these relations when he had sealed them by beginning in the wrong way.

So much we will say by way of preliminary, leaving certain more detailed suggestions for a later article.

THE PLUMBING IN A FIRST-CLASS BOSTON HOUSE.[1]

I.

Two special characteristics of the sanitary condition of Boston have made a sensible impression on the plumbing work which is usual in the better class of houses in the city. A part of the town lies very low, so that the sewers which drain it are little above the level of low tides, and as the rise and fall of the tide is very great, the compression of the air in the sewers from this cause is considerable, and the long stagnation of their contents favors the generation of gas, so that the back pressure is often sufficient to force the house traps, and the utmost precaution of vent-pipes and valves is found necessary, to prevent the air in the houses from being contaminated, and the plumbers are glad to adopt the best modern devices for cleanliness and security.

[1] Read at the Twelfth Annual Convention of the American Institute of Architects by Mr. T. M. Clark, A. A. I. A.

Another habit which has always been very general in the city is that of supplying the house pipes from a tank in the attic, fed by a rising main from the street pressure and provided with a ball-cock. Perhaps the inequality of surface, which brought a considerable part of the houses so high that in former times the water would flow into them only at night, when the consumption at the lower levels was reduced, may have made familiar a system which those who from experience had learned its superiority in the distribution of water through the house pipes have not been willing to abandon, although the necessity for it no longer exists.

In the application of these principles, the Boston plumbers practise certain refinements that are, so far as I know, peculiar to themselves, and which, it is no discredit to say, apply rather to the concealed working parts rather than to the ornamentation of stone-ware or plated work, in which the local taste is perhaps more sober than elsewhere. Some of their devices may not merit the full approval of a scientific engineer, but as attempts to meet certain wants they are at least interesting. An easy way of obtaining a connected idea of their mode of work, which can be compared with that practised in other localities, is to describe a typical house, one of many lately built or now building, mentioning particularly those details of workmanship which have most recently come into use.

Our house is liberally supplied with apparatus: three baths, five water-closets, six wash-bowls, and three slop-sinks are provided, besides the usual soapstone sinks, wash-trays, pantry-sinks, etc. The bath-rooms are in the middle part of the house, but on opposite sides, those on one side opening from the front chambers, and those on the other from the rear, and a well on each side affords a dim light.

Beginning in the cellar, we find a four-inch soil-pipe descending on each side nearly to the floor, then changing to five-inch they run along the wall to the rear of the building, where they join, and continue, still five-inch, through the cellar wall, and some distance beyond, to the earthen drain-trap. A four-inch iron pipe, running up independently inside the house, and opening above the roof, connects with the five-inch drain just at the cellar wall. This supplies fresh air to the bottom of the soil-pipe in the only way which would seem practicable in our climate. The English, with the same object of securing a circulation of air through the whole length of the soil-pipe, connect with it at the bottom a ventilated trap, opening at the ground level, outside the house wall. This satisfies them, but appears not to have succeeded very well here, and the plumbers, while accepting the principle, consider it necessary to carry up the inlet pipe where there will be no risk of cold air descending to freeze the trap, or of foul air issuing under the noses of the passers-by. The drain is made of iron for ten or twelve feet beyond the wall, on account of the danger from settlement of the ground, which in the new part of the city often breaks off earthen pipes close to the line of the building, and every second length is connected to the adjoining one with a Y-branch, the oblique arm of the Y being uppermost, with a round piece of sheet-lead cemented in, so that by cutting out the lead access may be had to the drain every ten feet, for clearing out obstructions. The vertical soil-pipes run up in chases eight inches by eight inches, formed in the brickwork, and the space around them is built up with pieces of brick and cement. All the iron pipes are painted with red lead.

On the cellar ceiling run all the pipes which are required to go from one side of the house to the other, none being allowed to cross the floors above. On one side, the stack of pipes ascends through the butler's pantry, with a board casing; the opposite stack, which passes through the principal rooms, runs up from the cellar behind the furring of a chimney-breast, and access to the pipes is managed by an opening framed in the beams of the cellar ceiling, and a ladder, made by nailing cross-pieces to the inner side of the studding which forms the breast. In the kitchen and laundry all the pipes are exposed, and all consist of brass tubes. The cold water tubes with their fittings are tinned inside, but those for hot water are plain, on the theory that the hot water, by its constant circulation through the cast-iron water front and over the galvanized bands of the boiler, acquires a taste which will always prevent its use in cooking, so that special precautions are not needed for it, while cold water pipes should be protected wherever there is any possibility of water for drinking or cooking being drawn from them. As only tubes are made with the coating of tin on the outside as well as the inside, the plumber has taken the trouble to scrape off all the outer coating, to make them look like the others. The brass tubes are used for hot water throughout the building, but for cold water only where exposed, lead pipe taking their place elsewhere.

The wash-tray wastes are trapped with one six-inch round-trap, into which the three waste-pipes are entered, all of them below the water-line, to prevent circulation of air from one tray to another. In the stories above, a similar mode of trapping is followed; wash-bowls, pantry-sinks, and baths are fitted with round-traps, four, five, or six inches, and the overflow and waste-pipes are separately entered below the water level, so that the circulation of air down the waste and up through the overflow into the room, or in the reverse direction, bringing with it in either case the smell of the decomposing slime which lines the waste-pipe, is completely cut off. The round-traps are suspended between the beams, so that the brass screw is flush with the floor, only the hexagonal projection for the wrench rising above the surface, and the overflow and waste-pipes are carried down at the back of the space beneath the bowl, so as to leave practically the whole of this space available for a cupboard, without lessening the accessibility of pipes and trap.

The water-closets are of the pan species, to which all plumbers are so much attached, but they are the best of their kind. The inside of the receiver is enamelled, and even the pan is improved by having a round piece of porcelain, some four inches in diameter and thick enough to be in no danger of breaking, cemented into the bottom, so that when the pan is at rest, nothing but porcelain appears in the bowl. Each is supplied from a service cistern, with lever and cistern valve. A one and one half inch brass coupling is inserted in the top of the receiver, and to this is attached a ventilation pipe, carried out above the roof. A bent pipe, pierced with a number of holes, encircles the top of the bowl, communicating with another ventilation pipe, carried separately to the roof.

In addition to this, all the traps are provided with air-pipes, which extend to the top of the house. Of course, some of them join in the ascent, but they are carefully sorted, so that the evil communications of those from the fouler places may not corrupt the good manners of the more harmless ones. Thus, the vent-pipes from the closet traps on each side of the house are joined in one, but kept separate from any others. Another shaft is devoted exclusively to the ventilation of the closet bowls, and the receivers have also one to themselves. The slop-sink traps have a separate pipe as far as the upper story, where it joins that from the closet traps, while the air-pipes from baths and wash-bowls are joined and carried up in one. All these are duplicated, one set being required on each side of the house, and with the open mouths of the two soil-pipes, and that which supplies air to the foot of the drain, we have thus eleven shafts projecting above the roof. This may seem an unreasonable number to an engineer, but our practical plumber by paying for them has borne witness to his sense of the necessity for them.

One other point may be mentioned to complete the description of this particular example of plumbing work. The house, like all others of its class in Boston, is supplied through the intervention of a tank in the attic, and in order to be able, at pleasure, to shut off the water from any part of the house, four separate pipes issue from the bottom of the tank, ramifying as they descend through the house into the smaller branches which supply the different apparatus. The usual mode of controlling the flow through these pipes is by a stop-cock close to the tank, but they are seldom used, and the ordinary ground faucets slowly corrode and become immovable. The compression cocks are better, but the course of the water through them, even when wide open, is very tortuous, and the supply at points below is less free on that account. In this case our plumber has solved the difficulty by putting on steam valves, of the kind known as the straight-way stop-valves, in which a solid gate of brass moves by the action of a screw directly across the bore of the pipe, and when opened leaves the water-way entirely free.

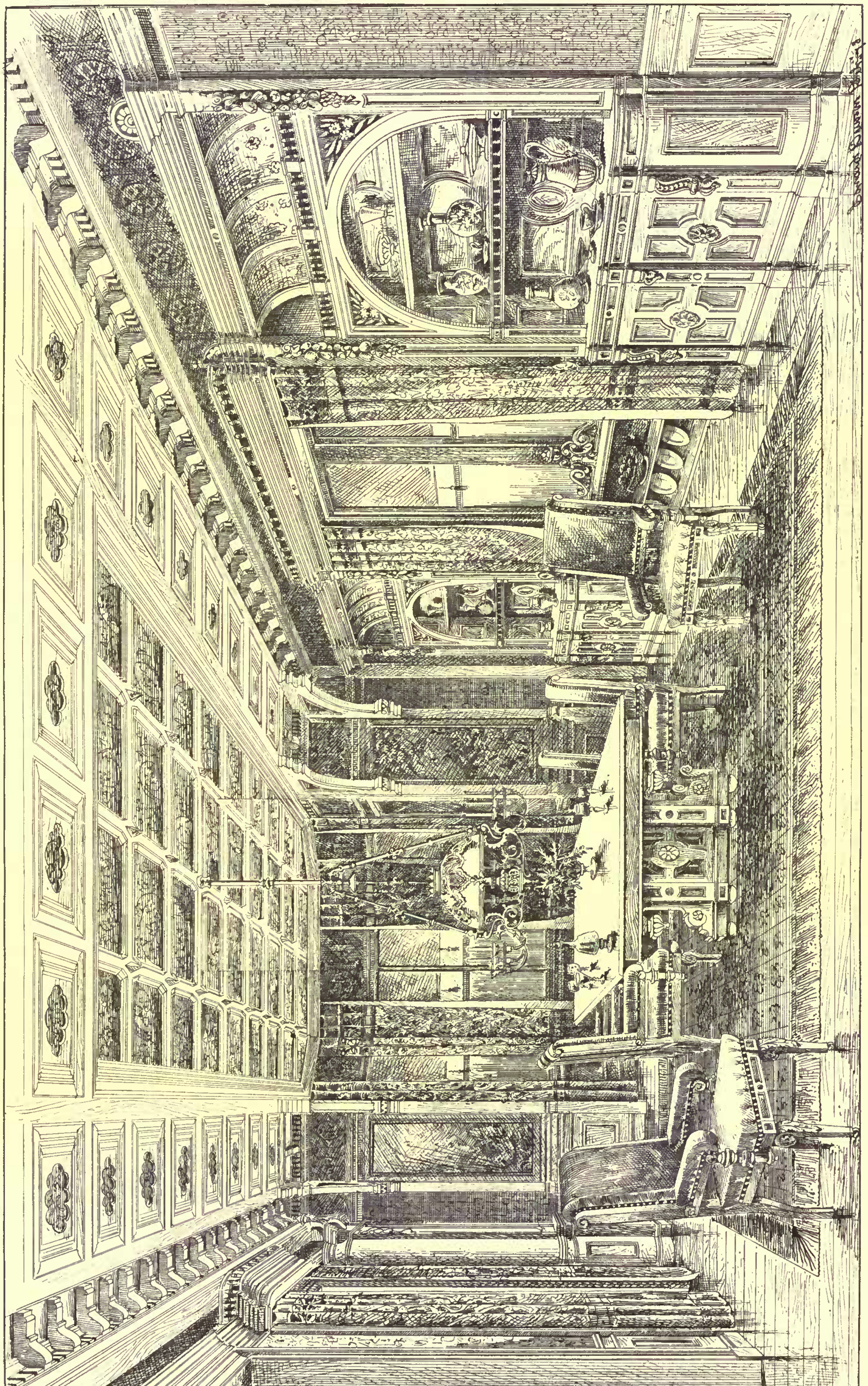
This is the kind of work which a first-rate Boston plumber, acting without any specification or directions from the architect, taking the job as sub-contractor under the builder, who troubles himself about the matter only so far as to require that the bids should be understood to be for good workmanship, thinks himself bound to put into the building. At half the cost, he could have completed his contract in a manner which would have passed inspection as good ordinary work, so that he has followed out his convictions of what was needful to a perfect job at his own expense. We have heard a good deal lately about the bad plumbers and their misdeeds; let us not forget to give the good ones, where we find them, such credit and encouragement as we may.

LATHAM'S SANITARY ENGINEERING. SECOND EDITION.[1]

This second edition is better and worse than the original. The decided merits which made that acceptable and welcome to all engineers of sewerage works are retained and amplified, and the marked defects which were conspicuous there are emphasized here. One can only admire the thoroughness and the good judgment with which the handbook parts of this treatise have been put together. But for all that, the book as a whole is disheartening; if an intelligent man, who has devoted his life to this subject, and who has driven his pen into its remotest corners, could fail to comprehend some of its simplest theoretical elements, what hope can we have that the general public, whose enlightenment is essential to sanitary reform, will ever learn what it needs to know?

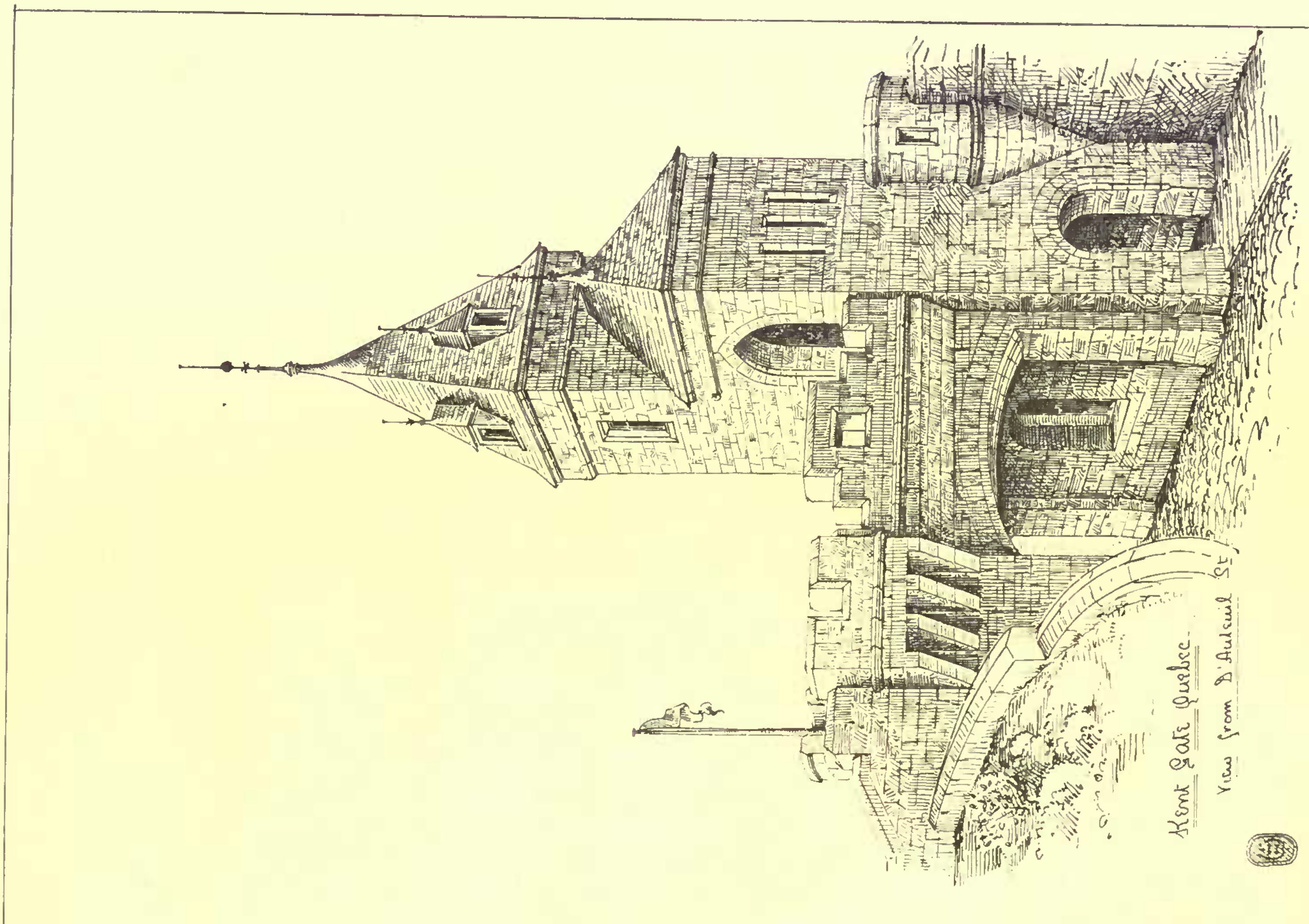
So far as we have examined the literature of the subject, the book is indispensable to the professional class for whom it was written. It really omits very little of the essential data concerning sewerage. The tables, the formulæ, and the illustrations of details of work are very complete, and they are conveniently and judiciously arranged. The general considerations which affect the arrangement of plans of sewerage are comprehensibly set forth, and all that the author has learned in his studies and in his practice is faithfully recorded. The result is not precisely a *vade-mecum* for the engineer, for Mr. Latham sometimes leads where it would not be judicious to follow. But he has gathered together pretty nearly all that

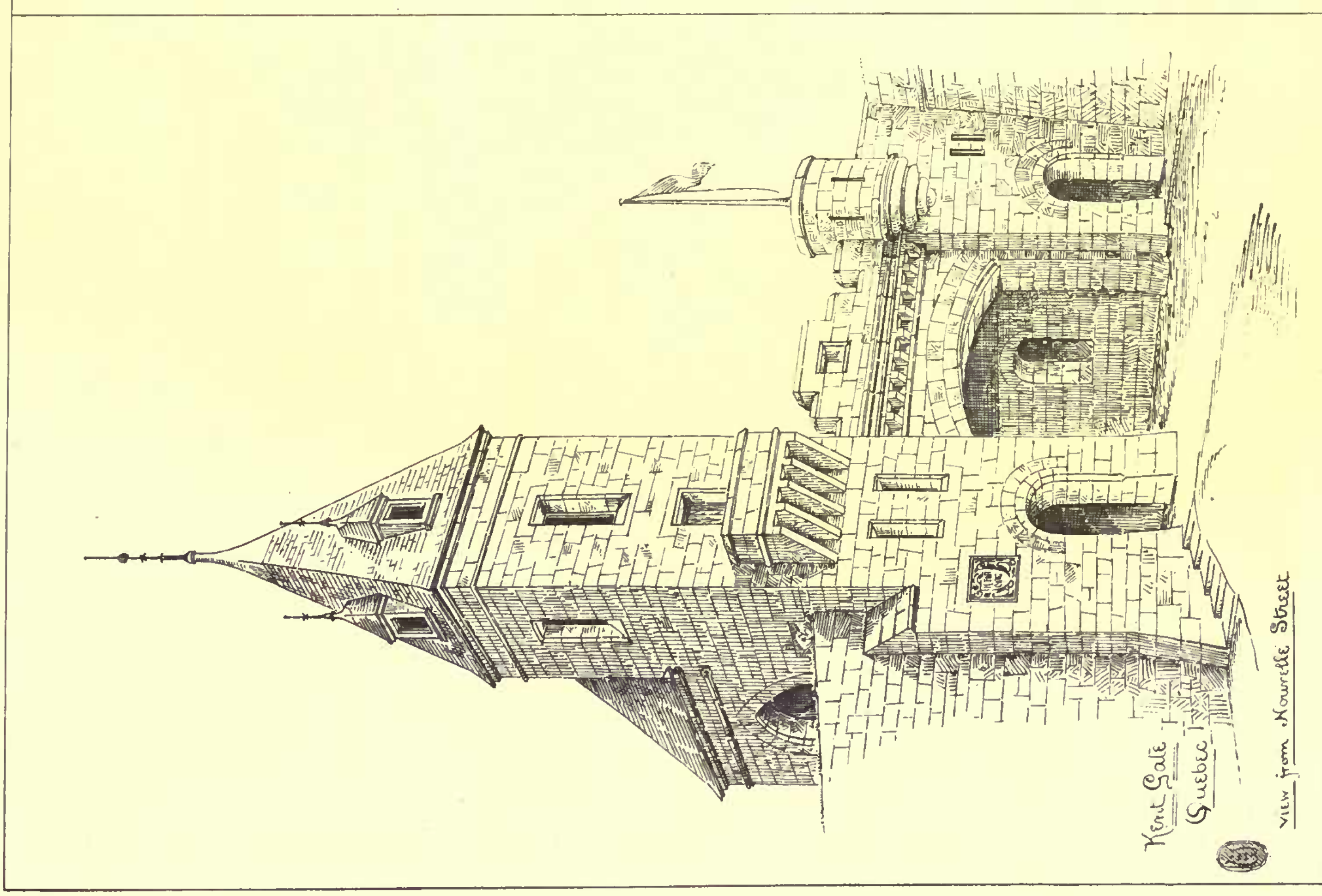
[1] *Sanitary Engineering.* A Guide to the Construction of Sewerage and House Drainage, with Tables for facilitating the Calculations of the Engineer. By Baldwin Latham, C. E., M. Inst. C. E., F. G. S., F. M. S., Past President of the Society of Engineers, etc. Second Edition. London and New York: E. and F. N. Spon. 1878.



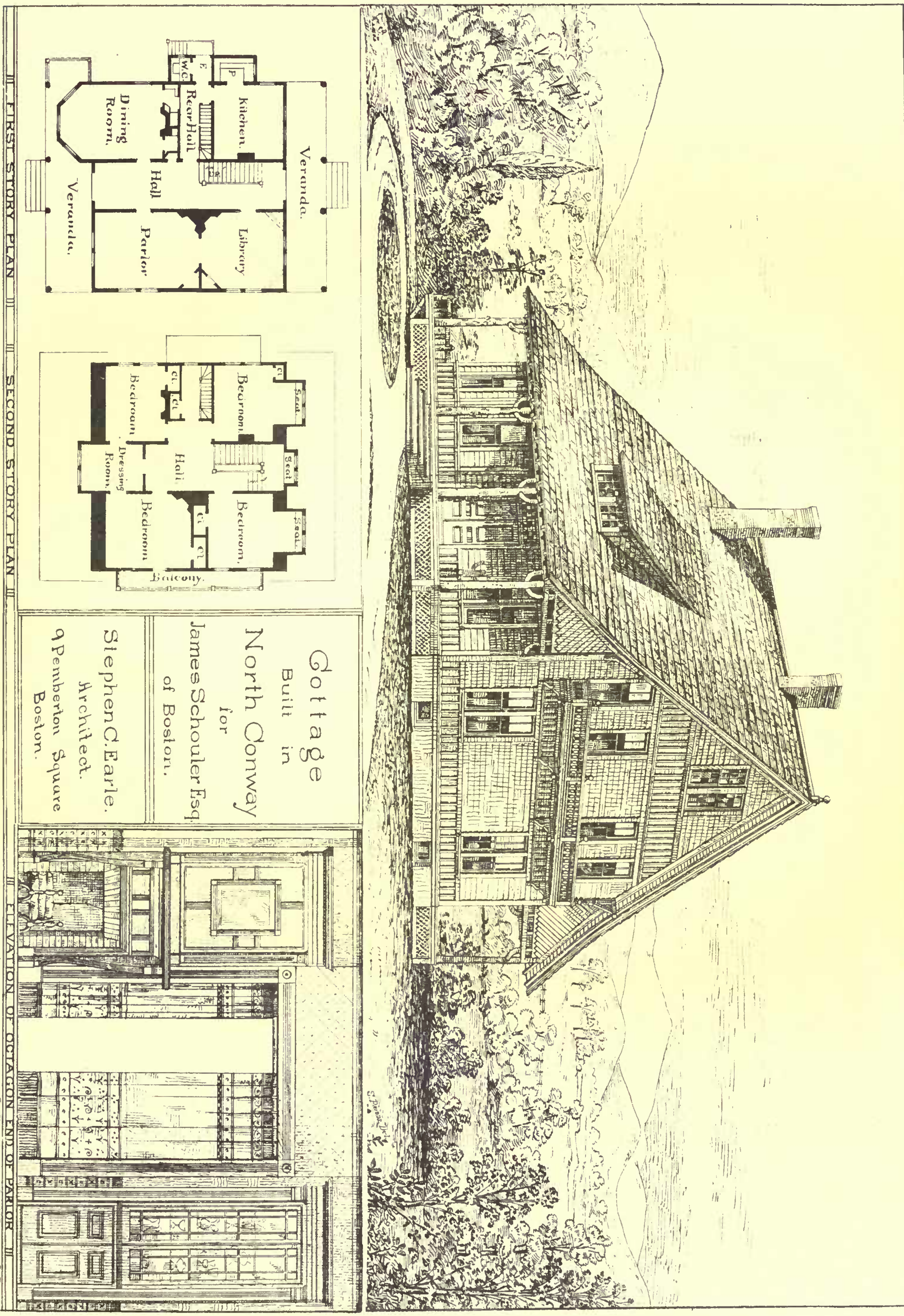
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a multitude of other books would give us, and has classified it under its appropriate headings. The novice should be wary in reading him; the readers of judgment and experience will have frequent occasion to thank him for having so thoroughly winnowed his professional library for their benefit.

That which will be found most directly useful is the series of tables, — over thirty in number, — giving the proper inclinations for given velocities; the different velocities for different inclinations; and the amount of discharge at various rates of inclination, for round sewers and for oval sewers of different forms, the sizes running from three inches to six feet in diameter for round sewers, and from one foot by one foot six inches to six by nine feet for oval sewers. The formulæ on which these tables are based are duly set forth and discussed, and the application of the tables in practice under different conditions is sufficiently explained. The practical execution of work under different circumstances as to ground, climate, material, and workmanship is treated, not perhaps so as to make an engineer of a common contractor, but so as to help an engineer of native shrewdness and ingenuity, in a very effective way. The practical work with which Mr. Latham has been connected is quite fully described, and its details are offered as examples. Many of these, as the construction of the sea outlet at Llandudno, will be found especially valuable here, where experience in the modern refinements of sewerage are only beginning to claim attention. The text is copiously illustrated with good wood-cuts, showing details of work, and there are twenty-three folded plates, filled with a great variety of appliances of all sorts, giving constructions of rain-water intercepters, the sewerage works of Dantzic, sections of sewers, artificial foundations, flushing gates and valves, flushing tanks, man-holes, side-entrances, gullies, traps, outfall works, tide and rain-water valves, penstocks, inverted siphons, cleansing tools, house-drainage, water-closets, and urinals, — the whole affording material for a very good general survey of the condition of the subject up to a recent time. It is to be regretted that the same thoroughness of description and illustration were not applied to the elucidation of the different methods for disposing of sewage in settling-tanks and by agricultural irrigation. Let us hope that Mr. Latham has only reserved this subject for future treatment.

While giving this hearty commendation to the work under examination, as a handbook for practice, we cannot withhold an equally cordial adverse criticism on other points. In the first place, and, if we are correctly informed, most important, is the relation in which Mr. Latham places himself to the construction of the sewerage works of Dantzic, for which he assumes full credit. On the plate which gives the general plan of the Dantzic Sanitary Works, except the sewage farm, we see, "E. Wiebe, C. E., and Baldwin Latham, C. E., Engineers for Sewerage Works." On page 479, we are told that "Mr. Wiebe and the author introduced a plan of sub-soil drainage, etc." So far as we have been able to discover, this is the only recognition which Mr. Wiebe, one of the first sanitary engineers of Germany, and emphatically the engineer of the Dantzic system, as it is so copiously illustrated in this book, receives at the hands of his assistant. It would have been no detriment to Mr. Latham's reputation if he had frankly stated the facts as they were, that is, if he had given us the simple fact that such a man as Wiebe had, when seeking in England for an engineer capable of arranging the details of his sewage farm, selected him, from among so many competent men, for this responsible service. It is of detriment to his reputation that he has treated this subject as he has done.

It is in treating of the sanitary aspects of his subject that Mr. Latham shows his greatest limitations, — largely by his habit of writing first on one side and then on the other, with no apparent recognition of the weight of either argument. On page 311, he quotes Dr. Carpenter, of Croydon, as saying "that all contagia are neither ethereal nor gaseous; that they are in themselves particulate and non-volatile." He adds: "If this is so, it must be difficult for the poison of enteric fever to become largely disseminated in the air of sewers." On page 321 he shows clearly, and proves by Dr. Frankland's experiments, that, in the bursting "on the surface of a liquid of bubbles due to the escape of gases generated during the process of putrefaction," aqueous matters are thrown into the air. The influence of watery vapor, which is constant in the air of a sewer, in carrying the impurities of the sewage, he seems to disregard. It would be easy to prove from his pages that perfect ventilation of sewers is dangerous, and to gather the inference that sewers which discharge their sewage before decomposition can arise are, so far as typhoid fever is concerned, as injurious as sewers of deposit. He accepts the germ theory of disease without question. Page 5: "Every disease has it own type, its own specific germ of generation. Every germ of disease requires conditions suitable for its development." Pages 324–5, speaking of the fetid organic vapor in sewer air, he says: "Of its exact nature and composition but little is known; either it is itself the cause of disease or it carries the germs of disease, which are supposed to float about in the air of sewers like the fine pollen of flowers floats about in the atmosphere. This vapor, or the germs of disease, can alike be effectually absorbed and destroyed by the use of charcoal." On page 312, he argues that as the lesion of enteric fever affects only a short length of the lower intestines, "the simple breathing of the poison would not carry it to the necessary seat of the disease." The medical authorities quoted to support this inference show why the breathing of air infected by typhoid-fever dejections *so often* fails to communicate the disease, — by no means do they attempt to prove that it may not be communicated in this way. In speaking of the sewers of Croydon as being free from decomposition, he makes no account of the decomposition of the slime adhering to their walls, though in other cases he attaches importance to this fact. He treats as a matter of consequence the fact that barometric changes alter the capacity of air to penetrate water, and the fact that water holding a certain amount of air during a high barometer must give out air during a low barometer, the air thus given out being foul (page 333). On page 371, he says that air carried into sewage by falling water "may be fouled in its passage through the sewage, so that when it escapes from the sewage, it may become a source of impurity in the air of the sewer." On page 425, he overturns this theory by the following remarkable statement: "One thing is certain with reference to malaria (*sic*), that all authorities are agreed that it is never extricated from a water surface. It is only after a swamp has become dry that malaria makes its appearance and commits its ravages. If we admit with Dr. Fergus that sewer air may be passed through the water of a trap, we may be assured, on the other hand, that anything injurious held in the sewer air would be washed out and held harmless in the water of the trap; for, however offensive and however overloaded water may become, so long as water remains, all experience goes to prove that no evil consequences follow." This was published, be it understood, in the last quarter of the nineteenth century, by one who assumes to be a sanitary authority. If true, it would solve the problem of privy vaults and cesspools, which need only be made tight and their contents kept liquid, to secure absolute safety.

On the technical part of the question of house-drainage, he shows much less knowledge and experience than concerning sewerage. He is here by no means a trustworthy guide. For example, on page 485, he says, "Lead is one of the best materials which can be used for soil-pipes." On the next page he recommends the use of vitrified pipes, built into the walls of new houses, as safe soil-pipes, which might be true if walls never settled. Concerning the ventilation of house-drains, he dismisses the applicability of "mine" ventilation, — which is exactly applicable here, because it is not applicable to a ramifying system of sewers.

THE ILLUSTRATIONS.

DINING-ROOM IN HOUSE OF GEORGE B. CHASE, ESQ., BOSTON, MASS. MESSRS. WARE AND VAN BRUNT, ARCHITECTS, BOSTON.

The decorations of this room have been contrived mainly with a view to increasing its apparent size, by opening the bay-window more completely into it, and by such a treatment of the ceiling as to encourage the idea of the extension of the area of the room into this bay. The beams of the ceiling are in butternut wood, enclosing pierced panels, which show the *fond* of the ceiling behind. This arrangement serves as a border carried around three sides of the room, and stopping against the bay end, where the beams are received by pilasters and trusses, enclosing painted panels, which serve as the most important decorative features of the apartment, and furnish its key of color. The central division of the ceiling is decorated with grape-vines in dead greens and blues, and divided by ribs of butternut. The frieze is in green, blue, and black, very dark, and the wall-screen below in light olive. The curtains are in dark olive greens and gold. The room receives southern and western light.

KENT GATE, QUEBEC, CANADA. MR. W. H. LYNN, R. H. A., ARCHITECT.

This gate is one of several which are to be built in the walls of the city, as explained in the description of the Quebec Improvements in the *American Architect* for April 14, 1877, the walls themselves being converted into a promenade around the city. The work is now being carried out by Mr. Thomas F. Scott, chief architect of the Department of Public Works.

COTTAGE AT NORTH CONWAY, N. H., FOR JAMES SCHOULER, ESQ., OF BOSTON. MR. STEPHEN C. EARLE, ARCHITECT, BOSTON.

This cottage, built during the past season, is situated near the Intervale House and commands a charming prospect of the Saco, the meadows, and the mountains. It is designed as a quiet summer residence and has been treated very simply, inside as well as outside. The finish being white pine without paint and the floors plain hard pine. A. Turber, of North Conway, was the contractor. The cost was about $5,000.

DESIGN FOR A SOLDIER'S MONUMENT. MR. E. C. CURTIS, ARCHITECT, BOSTON.

MONUMENT TO ROGER WILLIAMS, PROVIDENCE, R. I. MR. F. M. HOWE, ARCHITECT, BOSTON.

This monument is to be placed by the city of Providence in the burial-ground of the Roger Williams Park in that city. It is the accepted design of those offered in an open competition held last December.

THE LATE R. G. HATFIELD.

Both the profession and the public in New York lose in Mr. Hatfield one of the most valuable members of the profession, — a loss that in many respects cannot be made good for a long time.

His superior knowledge of all that appertained to construction, the general breadth and wisdom of his views upon all subjects in

which he interested himself, his extremely systematic and business-like habits, and his conscientious and upright character caused him to be one whose name added strength and confidence to any matter before the public. On this account his advice and counsel were continually sought in public matters connected with his profession. His last labor was the careful examination and analysis of the multitude of plans presented in the "model tenement-house" competition. I met him at the hall, a few days before his death, and could but greatly admire the patience with which he examined and thoroughly analyzed each scheme. A few that seemed upon a casual glance entirely devoid of merit, and called forth a jesting remark, drew from him the reply that they had some good features, which he proceeded to point out, showing that nothing had escaped his careful examination.

Mr. Hatfield was widely consulted by members of the profession in regard to difficult problems that came before them, and always with satisfactory result. The great iron roof of the Grand Central Depot was planned by him, as well as the roofs of several of the largest churches in the city, where the support was obtained from longitudinal trusses of unusual length. When not engaged in business he amused himself with experiments testing the strength and qualities of materials, and from time to time gave interesting statements of results reached.

His professional work was not highly artistic in character (his reputation did not rest upon this), but it was oftentimes very ingeniously planned, and always well executed.

The crowning work of his life, however, has been his treatise on Transverse Strains, which has met with high commendation from every quarter, especially from English engineers and architects. The extremely complimentary notice of this work by a prominent English engineering journal, not long since, must have been not only very gratifying to Mr. Hatfield, but to the profession in our country generally, who were honored in the honor of their fellow member.

For many years he has held the arduous and thankless office of treasurer of the Institute of Architects, managing its affairs with great care and wisdom. A view of his accounts not long since revealed an unexpected amount of labor and attention, and led to an appreciative expression of his goodness in having so long and admirably carried on this work. He, however, made light of it, saying that system and the trained assistance he had in his office prevented it being burdensome. He seemed to like to do those things that were in danger of being neglected, — things that were not interesting or pleasant, and so were likely to be avoided by others.

His loss will also fall very heavily upon the New York Chapter. He was a president who had the respect and good will of the entire profession. Petty jealousies and pique never seemed to connect themselves with him, but his name added strength and dignity to the Chapter. He was rarely absent from the Chapter meetings, and often contributed greatly to their interest. Those who have met him frequently during the past year have noticed a certain mellowing of character, an increase of kindly, genial feeling, that has made him a most agreeable companion, and will render his memory especially pleasant.

The funeral at his home in Brooklyn was attended by delegations representing the Board of Trustees of the A. I. A., the New York Chapter, and the profession generally. A former pastor of Mr. Hatfield's, who took charge of the service, based his remarks upon what he considered his strongest characteristic, "love of truth," and showed very forcibly how this had influenced his whole life. It had, he said, made him in the church a most valuable member, a pillar of strength. By truth the speaker said he meant not mere veracity, but something much broader and deeper, that delighted to ascertain the right, to go to the bottom of things to find it, and that saw through and stripped off all disguises. Returning with him one Sunday evening from a brilliant discourse, he asked Mr. Hatfield how he liked it. "It was fine as a rhetorical effort, but the conclusions could not be logically drawn from the premises laid down." Then he proceeded to show the mistakes and fallacies of the argument. This love of truth the speaker thought interested him in the chosen specialty in his profession, and was the guiding impulse of his life. C.

CORRESPONDENCE.

CHURCH ALTERATIONS. — THE STATE HOUSE. — A NEW CITY HALL.

HARTFORD, CONN.

An important work to be undertaken in this city during the approaching spring from designs by Mr. Withers, of New York, will be the alteration of the chancel end of one of our oldest Episcopal churches, — Christ Church, — together with the building of a chapel in the rear of the church. The edifice, an example of Perpendicular Gothic, was built by Mr. A. J. Davis, of New York, under the direction of Dr. Wheaton, the rector, a gentleman of strong architectural proclivities. The alteration will provide a recessed chancel with a rich stained-glass window of foreign manufacture in place of the present one. The chapel will replace the rather primitive structure which now occupies the site, and will be connected directly with the church. Besides affording ample room for the Sunday-school, accommodations will also be provided for meetings of the church missionary society and for other parish organizations. The entire work will be a gift to Christ Church from the widow of the late Major James Goodwin, of this city.

The recent criticism on the new capitol in Hartford, by Mr. Clarence Cook, has been received with diverse comments. While in some cases he has passed severe strictures upon the work, in others he has, it must be confessed, hit the architectural nail firmly on the head. The just dealing and fair action of the commissioners are to be commended, and yet it is to be regretted that the same spirit manifested in a portion of their complex duties was not carried out to the end. It remains in the minds of inquiring persons a conundrum unsolved, why the state comptroller should necessarily add to the list of his controlling duties the control of the finishing of the various rooms, while the matter of decoration was intrusted to the hands of a professional. Naturally, the result has been a clashing of ideas and a want of harmony. The economical action in regard to the statuary, referred to in a former letter, by which the figures are to be duplicated, received at the hands of the *Tribune* critics merited censure, while the sentiments with reference to the surmounting figure in bronze are echoed daily by the many people who lift their eyes to the crowning "Genius." Apropos of this work of art, the latest plan regarding it is to make a change in the position of the arms. An alteration of the model has been made in Rome by Mr. Rogers, the sculptor, and photographs of the altered statue have recently been received by the chairman of the commissioners, which show the right arm of the figure elevated above the head, the hand holding aloft the wreath of immortelles. The position is unquestionably an improvement upon the former, and adds a grace to the figure which to critical eyes is wanting as the figure is now exhibited to the public.

The success of the representatives' hall considered with relation to its acoustic properties is a mooted question. It has been suggested that the floor of the hall should be raised so as to bring it on a level with the first floor instead of with the mezzanine floor as at present. Should this plan be carried into effect, the main entrance vestibule to the building on the south will be treated with a vaulted ceiling corresponding to that in the north vestibule. Experiments have, by order of the legislature, been made in the representatives' hall, to better the so-called defects in the acoustics. The processes and results are of deep interest. Upon the removal of a curtain suspended over the hall at a few feet from the ceiling, and which it was said improved the hearing, it was found that the voices of the members could be heard as well as when the ceiling proper was hidden from view! At this writing a second experiment is being made with wires stretched across the ceiling, and it would not be a matter of great surprise if after all schemes had been tried the whole subject was let alone, and by the close of the session it was discovered that when the speakers had become accustomed to the hall, their voices could be heard without much difficulty, while the hue and cry about the sad failure of the capabilities of the elaborate hall was a rather large-sized tempest in the legislative tea-pot.

State House Square, on Main Street, the original site of the old public building, and its vicinity, will probably undergo material changes during the coming season. A new five-story block is to be built upon State Street, nearly opposite the periodically progressing granite post office. The block is from the designs and plans of Mr. S. W. Lincoln, a local architect. It will be built of brick, with a finish of Ohio sandstone. The front is divided by a central projection into two bays, and is thirty-six feet wide. The ground floor will contain two stores. The building will be begun at an early date, and will cost about $12,000.

A valuable site on the same street, flanked on either side by brownstone front banking houses, has been purchased by the Hartford *Daily Courant*. It is rumored that a substantial block will be built by the association at no distant day, intended in part for the *Courant* office and in part for other business and professional offices.

The growing needs of the city, as well as the recent abandonment of the old State House, have given rise to a question of some moment to the profession, namely, the possible, if not probable, erection of a public building for the accommodation of the various city offices. As is customary, there is a certain amount of opposition to the project, on the ground of unnecessary expenditure. The economists have already secured plans for the alteration of the old building, at an expense of some $7,000; but by this arrangement complete accommodation could not be furnished, and on this ground, as well as for other cogent reasons, it is deemed prudent by a second party to build a city hall which shall in every way satisfy present and prospective wants. The question is further complicated by a division of opinion regarding the feasibility of building in connection with the city hall a structure intended for county purposes, the expense of the entire work being borne equally by city and county. A county building is a desideratum, and if it is not built in this way will, without doubt, occupy a lot in another part of the city. Among the sites mentioned is a position near Bushnell Park, and within a short distance of the capitol.

Turning aside from this warm discussion, it is refreshing to chronicle the erection of ice-vaults, built from plans by Charles Stole, architect, of New York. The front is built of common brick, laid in red mortar; the finish is of Canaan marble. The building is four stories in height, and midway upon the front is a projecting corbel of marble supporting a large and somewhat pretentious statue of Gambrinus.

Among the private dwellings in process of erection in the city is a brick and stone house for Judge White, from plans by Mr. J. C. Mead. A pleasing variety in the use of material is given by the in-

troduction of excellent moulded brick. The diaper brick used in the principal bands are of New Haven manufacture, and are worthy of extended use by reason of their fine quality as well as for the excellence of the patterns. CHETWOOD.

AN EXHIBITION OF WALL-PAPERS.

CHICAGO, February 20, 1879.

LAST Thursday evening an entertainment of a novel and interesting character was given to a few invited guests at the rooms of John J. McGrath, in this city. It was the first of a series to be continued through the winter and spring, the remainder of which will doubtless be thrown open to the public. The object of the exhibition was to show the progress made in the designing of wall-papers of late years, compositions and arrangements of papers for decorative purposes, and combinations of printed wall-papers with painting by hand. The last of these is a process of recent introduction. Paintings are executed on plain wall-papers after hanging, or on diapered patterns in color or gold used as backgrounds, or printed designs are varied by handwork to harmonize with surrounding details, either by painting out or filling in. Sometimes two printed patterns are blended into one. as was shown on a folding screen. Common canvas printed in bold chintz patterns is toned down by glazes of oil color and used as a background for figure painting. A French example of this was exhibited. Wall-papers with gold grounds are painted with oil colors, those with colored grounds in distemper, or the same colors as are used by the print work.

A large number of papers and samples were exhibited which had been collected by Mr. Joseph Twyman during a recent visit to France and England. Among these was Walter Crane's new peacock frieze, designed for Jeffrey, especially to be exhibited at the late Paris Exposition, just as his Marguerite paper was issued by the same house for the Centennial Exhibition, — though seen then by few, for it was hidden away in a lofty gallery. The frieze paper of this last-mentioned set, commonly known as the Alcestis frieze, — as it portrays Queen Alcestis and the womanly virtues which she possessed, as described in Chaucer's "Legende of Gode Women," — was exhibited in a frame. It contains, besides the queen, her guardian angel and four female figures typical of her virtues. The peacock frieze is made in heavy, embossed paper intended to imitate leather; several shades of bronze are used on it besides colors. The peacocks, with outspread tail feathers, stand, I may say, in front elevation. Between them are represented, as described by Mr. Crane, the winged genii of time, with sickles in outstretched hands, mounted on harvest cars. The full set of papers,[1] of which this frieze is only a part, received a gold medal at the Paris Exposition. Another frame contained a frieze pattern by J. Moyr Smith, representing the seasons by figures of men ploughing, sowing, reaping, and threshing. Another frieze from De Fossée, of Paris, was exhibited. It is twenty-four inches wide and represents the Triumph of Ceres. The pattern is thirteen and one half feet long without repetition, and it required one hundred and thirty-two engraved blocks to produce it. This is probably the most costly piece of hand printing ever attempted. A frieze by Le Cerf of Paris was sixty-two feet long and twenty-eight inches wide. It was mounted on canvas and hung on one of the side walls in a heavy black frame. It contained twelve different figures on gold grounds, being flat, conventional drawings of men in various occupations of life. Each figure was divided from the next by a diaper pattern on gold ground. The whole was enclosed with horizontal and vertical borders of Gothic pattern. This is the only set of the frieze that has been brought to America.

Mr. McGrath exhibited a number of his own private patterns, many of them specially designed for him. He is one of the few dealers who have employed American artists to make special designs for wall-papers.

The outer walls of the entire room were draped from cornice to floor with about three hundred patterns of paper, representing the different periods of decoration from the thirteenth century to the present time.

English designers were represented by J. Moyr Smith, B. J. Talbert, Dr. Dresser, Walter Crane, William Morris, Wilberforce, R. Bennett, Milford Warner, Henri, and the late E. W. Pugin and Owen Jones; Americans, by Deisner, R. Sturgis, Wight, and Twyman; while French manufacturers were represented by Ballin, Hoch Frères, Gillow et Fils, Bézault et Patti, and De Fossée of Paris; English manufacturers were represented by Jeffrey, Carlisle & Clegg, Scott, Cuthbertson & Co., and Tolman of London, Trumbull & Sons of Leeds, Potter of Darwin, Lancaster, and Wylie & Lochead of Glasgow. The leading American houses of Philadelphia, New York, and Brooklyn were also represented.

There were some examples of papers, dadoes, and friezes called in England the "Adam style" of decoration; very Italian in feeling, with just a touch of the English pervading both coloring and design. The style gets its name from the brothers Robert and James Adam, celebrated architects of the eighteenth century. It will be remembered that some mention of the works of these men was made in the papers on "Decorative Fine Art Work" at the Philadelphia Exhibition of 1876,[2] Messrs. Wright & Mansfield, of London, having exhibited some panelled decoration in that style, which is just now the fashion in London. The only examples of it which have been produced were brought over by Mr. Twyman.

The leading feature of the exhibition was a series of screens hinged together, three in a set, and representing the sides of a room. Four suggestions of rooms were thus presented with two sets of screens, they being covered on both sides. The first showed a drawing-room treated with combinations of papers, American and English, and had painting on paper grounds. The main wall-paper of this room consisted of a well-drawn holly in gold and color on a background representing mistletoe on a black ground. This was separated by an ebonized picture rod from a very broad frieze consisting of a black ground with branches of mistletoe and holly painted in oil colors from designs of Mr. Twyman. The frieze was broken up at distances of about four feet by panels having in them the figures taken from Walter Crane's Alcestis frieze on dull red ground. A panel representing the space over a mantel-piece contained a painting in oil colors on figured canvas representing a *grande dame* of France in early eighteenth-century costume; surrounding the painting was a border of heavy Utrecht velvet paper, with ebonized mouldings between it and the picture. A dado paper, separated from the main wall-paper by an ebonized chair moulding, was in myrtle greens and gold, of English make. Above the mantel panel was a black panel, with ebonized shelf between, the background being left plain to afford relief to plaques or pottery. Gilt sconces were placed on each side of the mantel panel. The apartment had a dull maroon India rug on the floor, and contained a few ebonized chairs and a spinning-wheel. The second apartment represented decoration suitable for a dining-room. A wall-paper eight feet high from the base moulding contained straggling branches of orange-tree in six different colors of flocks on a greenish metal ground. Above it was a twenty-inch band of maroon velvet paper hung with Delft plates and some hand-painted ones by American women. The frieze above this was thirty inches wide, with gold ground, having painted on it a bold growth of lilies springing up at irregular heights. A door was represented, and over it a shelf containing some blue Flemish stoneware. The side casings of the door ran up to the ceiling. The first panel over the door was plain maroon velvet. The second panel in line with the frieze consisted of a branch and bird painted in oil, with Japanese contempt for symmetry, upon a gold paper ground. This was designed by Mr. Twyman. The third room represented was suitable for a library. The lower paper was of Japanese character, with vines on gold ground. It was eight feet six inches high, and intended to form a proper background for bookcases. Above this was a thirty-inch band of gold mosaic pattern, forming an excellent background for some busts which were placed against it on brackets. Above it was an eighteen-inch frieze of the same tones of color as the main paper. The fourth apartment suggested a reception room in the Henri IV. style. It was entirely decorated with imported French papers, having panel treatment throughout. But the panellings were formed by interlacing flat bands of ebonized wood, which removed all suggestion of constructive work, bringing out the full decorative or pictorial effect of the very rich papers employed. The styles were embossed Utrecht velvet, very wide; the mouldings around the main panels were in double rows, with inlays between of eighteenth-century design; the panels were of French tapestry paper, in dull browns and reds with gold thread on deep russet ground. Draped across one end of the room was a piece of Henri IV. tapestry. The floor had an old Persian rug. Paintings hung on walls had gold frames. The furniture was ebonized, with rich tapestry coverings. All the papers in this room were made by Bézault, of Paris.

With such an exhibition as this before us it needs but little reflection to realize what an immense advance has taken place in the designing and manufacture of wall-papers within the last five years. It is not long since a few enthusiastic architects would clutch to their bosoms any samples of artistic papers that might come into their hands, and hoard them up as precious things. To be able now to go into a store and select from three or four hundred patterns, all designed by the first artists of England, France, and America, must be regarded by every lover of the beautiful with genuine satisfaction. But to visit a private exhibition of three hundred wall-papers and not see a single pattern which is bad in design may be safely said to be one of those things we have scarcely dreamed of. W.

[1] The *Building News* for February 21, 1879, contains an illustration of this set of papers, which formed part of Messrs. Jeffrey & Co.'s exhibit.

[2] *American Architect*, vol. ii., p. 3.

COMPETITION IN INTERIOR DECORATION.

COMPETITION NO. II. — A SIDEBOARD.

THE subject of the second competition will be a sideboard in the dining-room of a retired manufacturer whose former employees have presented it to him with a view to its displaying a full silver dinner-service (which is not necessarily to be indicated), also presented by them. It is placed between two windows and opposite the fireplace, and its ornamentation, which is to be properly subordinated to its general design, is to indicate the manufacture in which the gentleman acquired his property. The extreme length of the sideboard is not to exceed nine feet, and its height must be less than the height of the room, which is fourteen feet.

Required: An elevation, a section, and details to a larger scale.

Drawings must be received at the office of the *American Architect* on or before April 5.

ARCHITECTURAL STUDY.

To the Editor of the American Architect:

Sir, — I have just read an article in your journal of February 22, entitled "Young Architects."

I have wished for some time to see such an article published by an able architect, as I take the writer to be, that I might reply to it through your columns, asking that the same architect, or some other, might, in an article as clearly and well written, tell young architects how to stock their minds with the information that will enable them to show in their work that valued homogeneity to which he refers, and the absence of which he so deplores in most of our architects.

There are many young men ambitious to become architects who are not able to attend the architectural schools for the limited term of two years, nor even for one, myself among the number, but who have to work alone and teach themselves.

Will the writer of the article in question try to assist this class of young architects to make of themselves something besides mere copyists; will he, instead of dealing in glowing generalities, prescribe a course of study, naming the books that will be the best text-books, the order in which they should come, etc.?

Those who live outside an architectural atmosphere are at a loss how to select books. They send for catalogues, select books, and when they receive them find them comparatively useless. The writer of "Young Architects" can confer a favor on a large class similarly situated to myself, and do some good in the cause of architecture by descending to details in his information.

Take for granted that a man has a fair mathematical education, is a fair draughtsman, — then give him a list of text-books that will put him on the road to make himself an architect, not merely in name but in truth. Young Architect.

NOTES OF EXPERIENCE AND INEXPERIENCE.

3. Furnace Hot-Air Pipes. — "Hot Air" may be able to get a freer current by raising the end of the pipe leading to his northwest room, so as to get the ascent as steep, and the flow consequently as rapid, as possible. If the cellar is too low to do this, a conical top to the furnace helps to throw out the warm air in all directions. The Archimedean-screw ventilator would be worse than useless. It is very difficult to get furnace heat into exposed rooms on the ground floor, unless the furnace is placed, as it should be, considerably away from the centre of the building, toward the cold side, so that the air can ascend to those rooms nearly vertically. With second-story rooms the greater vertical height of the pipe, like lengthening the leg of a siphon, helps the upward current, and perhaps "Hot Air" might, if not inconvenient, extend the pipe up nearly to the ceiling with good effect. The most certain way of heating both the warm and the cold sides of the house is to use a furnace, like Kohler's, with a double air-chamber, of which one division is exclusively devoted to the northwest rooms, and the hot air from it must go there. It is easier to direct the current from a furnace which has small radiating surface, and therefore heats the air very hot, as some of the wrought-iron furnaces, than from those whose radiating surface is large, and the air, although delivered in great quantities, not sufficiently heated to give it great ascending force. Much can, however, be done by rounding the elbows, and making the course of the warm air to the exposed room as easy as possible. C.

4. How to Proportion Chimney Flues. — It is impossible to give any rule for proportioning chimney flues, whose action depends on an infinity of circumstances. In general, air-tight stoves can bear the smallest flues, 4 × 8 inches being often given them. Open stoves need as much as 8 × 8 inches, and this is enough for a kitchen range, and will do, if the flue is smooth and straight, for an open fireplace not over 30 inches wide, or for a furnace flue, though 8 × 12 inches is better. A good-sized open fireplace needs 12 × 12 inches. Steam boilers absolutely require a large flue; 16 × 20 inches, or 12 × 24 inches, is not too large. All these suppose that the flues are vertical, so that by looking in at the fireplace one can see the sky above; when they are inclined or tortuous they must be at least one half larger, and must be made smooth inside, either by striking the joints smooth, or by pargetting. With these dimensions, flues carried well above the highest point of the roof, in a level country, will be sure to work well. If there are hills as high or higher than the house within a quarter of a mile, the probability is that no flue can be built which will work properly when the wind is blowing from them. The air seems to ascend the hill and pour over the crest in a cascade, which inevitably checks the ascending current in the flue, and no ventilating cap that I know will cure the difficulty. The effect of the hills shows itself at great distances. In Geneva all sorts of devices are resorted to to keep the chimneys in working order, although the mountains are miles away. The principle on which most of their flues are constructed is to give them two outlets, facing in different directions. When the wind is blowing down one, it is presumed that it will not at the same time blow down the other, and the air which descended by the first rises again and escapes by the second. It is always well to narrow the top of a flue slightly, and the throat is of course contracted. These two contractions keep the warm air between them from being mixed with cold air from above or below, and thus preserve its ascension force. C.

10. Hot-Air Pipes. — In a late number of the *Metal Worker*, the editor says he should want at least eight inches clear space all around a hot-air pipe from a furnace. He thinks that no insurance inspector would consent to running a pipe up in a stud partition. Now I would like to know how many furnace pipes in this region are eight inches from any woodwork? Consider that to enclose a ten-inch pipe with such a liberal space would make the outside of the enclosure three feet in diameter, say nine square feet, and the extra size of the house rendered necessary by carrying up second-story pipes in this manner would cost more than the furnace itself. For myself, I confess to having carried up numbers of hot-air pipes in four-inch partitions, and I venture to say that most architects have done the same. Of course, we should, if we had the whole control of the plan, manage to run all the pipes in closets or inferior rooms, where only plastered surfaces would be exposed to the heat, but when parties bring us a ready-made plan which they say "just suits them," and, on our suggesting that there is no place for the heating pipes, say that they do not wish their arrangement changed for such trifles, I do not see that we can be expected to do anything more than get the pipes into the partitions with as much care as may be If we can get the furring of a chimney-breast to carry hot air in, we may consider ourselves fortunate, and yet in this case there would seldom be more than two inches between the tin and the studding. For myself, I have been in the habit of specifying that all woodwork within two inches of the hot-air pipes should be covered with bright tin, tacked on, and of seeing that it was done, and would like to know, among the thousands of country houses built every year, how many are better protected, and in what way.

Architect.

NOTES AND CLIPPINGS.

The Permeability of Building Stone. — The Buffalo *Commercial* gives the following account of an interesting experiment with building-stone in that city: "Yesterday Professor Doremus, of the Buffalo Medical College, performed a very interesting and instructive experiment before his class. A block of sandstone, such as is usually employed for window-caps and sills, and about twelve inches square and four or five inches thick, had a panel one half an inch deep sunk in each side. In each panel was fitted a block, which was perforated by a piece of common gas-pipe, and this was cemented about the edges. The whole was then coated with an impervious varnish. Air now entering the pipe on either side had access to the clean surface of the stone beneath the panel, and it was found that if the mouth be applied to the protruding pipe on one side, and a candle be placed in front of the opposite one, it could very readily be blown out by the air, which, with very little effort, was forced through the stone. When a rubber tube was connected with the house gas-pipe on one side of the stone, and a burner was attached on the opposite side, the simple pressure from the gas mains was sufficient to force the gas through the stone till it was lit at the burner on the opposite side. When by any means the pressure was increased, a very large flame was thus produced. This shows the permeability of building stone. Brick walls and the plastering of rooms are much more porous, and it is readily seen that unglazed tile, or stone, or brick sewers afford but little security against the escape of sewer-gas."

Zinc-Dust as a Cause of Fires. — A recent issue of the *Insurance Record* calls attention to the dangerous character of zinc-dust, which appears to be imported into this country in considerable quantities for use in certain branches of industry. The material presents the appearance of a gray powder, in an extremely fine state of division, and its use appears to be in the manufacture of paints. Chemically, it contains as much as forty per cent of metallic zinc-dust, the remainder being oxide and carbonate. Another variety of the same commodity, known commercially as slate-colored zinc oxide, contains really very little or no oxide at all, being almost wholly a metallic dust, which, in the process of manufacturing zinc-white, has escaped combustion, and is deposited in the flues of the condensing apparatus. These products, the *Insurance Record* points out, are extremely apt to cause mysterious fires, if precautions are not taken to keep them from contact with moisture; for, owing to its very fine state of division, this metallic dust, in the presence of moisture, will eagerly oxidize, and as this oxidation will be attended with a very considerable rise in temperature, the hydrogen gas evolved in the process may be inflamed, and, directly or indirectly, inflammable materials in the neighborhood may be ignited, and in this way the building or ship in which it happens to be stored may be destroyed, while the cause of the disaster may never be suspected. The *Record* points its moral by citing the case of the fire in the steamship Lord Clyde, in the year 1876, which at the time attracted some attention. The facts in this case were about as follows: A number of casks of zinc-dust were placed in the hold of the vessel, without any notice of the dangerous character of the material having been given to the owners of the ship. The casks, or some of them, by some means got wet, and within twelve hours after they had been put on board, the vessel was found to be on fire. When the source of the fire was discovered, the contents of one of the casks were found to be red-hot. As another contribution to the causation of what, for want of a better term, are called "spontaneous" fires, the facts above detailed are worthy of special attention.

A Triennial Salon. — It is said that the French Government have concluded to have triennial as well as annual *salons*. The triennial *salon* will be a recapitulation and selection, and made up of the best pictures exhibited at the annual *salons*. The counsel cannot and indeed do not wish to exclude a large number of meritorious works annually sent in, but on the other hand a more vigorous principle of selection has become necessary, and it has seemed possible that a solution of this difficulty might be found in the plan of holding every third year an exhibition of works carefully chosen by a competent jury from among those already submitted to the test of public opinion through the yearly *salons*.

Cremation. — A correspondent writing to the *Pall Mall Gazette* on the subject of cremation says: "But all this seems to me rather clumsy and tedious bungling. If we are not satisfied with the slow decay in mother earth, and must have a rapid mingling with the elements around us, why, with all our scientific advances, stop short at fire and furnaces? Would not electricity do it for us more neatly and expeditiously? I have seen surgeons disperse tumors with their wires almost magically; and it would be more decent and convenient if some Davy or Faraday reduced us between the poles of his battery to a little metallic button, or sent us into space like a Jablochoff candle."

Immigrating Architects. — The landing of twenty-two architects at Castle Garden last year shows, perhaps, that the hard times in this country are less repellant than the hard times abroad.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, MARCH 15, 1879.

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WE mentioned briefly last week the awards in the tenement-house competition, of which the premiated designs were illustrated in the last number of the *Plumber*. Not having been able to see the exhibited drawings, we can have no opinion concerning the wisdom of the awards; but the issue of the competition points to some conclusions which are safe and not altogether unexpected. We notice that all the prize designs are of one class, that is, they all have a yard at the back of the lot — which indeed was the one provision about which there could be no question, though some of the competitors neglected it — and they all show two buildings, each giving two suites of rooms to a floor, connected by a narrower neck, as it were, in which are stairways and closets, with a court for light and air in each side. In all there are lifts in the connecting centre, and in all but one water-closets, the water-closets in the fourth being in the yard at the rear. The tenements are all arranged in pairs on each side of the central axis of the building, and include three rooms apiece, excepting in one plan, where those in the rear building have but two rooms. The middle rooms necessarily have only borrowed light and air, though there is an effort to relieve the condition of some of them by ventilating-shafts in the walls. In two plans these shafts are widened so as to allow a window to open on them, and in that which won the first prize they are marked, as if with a grim feeling of satire, "light and air." The amount of light that would penetrate five stories down, to the bottom of a slot, one foot wide by six or seven feet long, in the thickness of a party wall, would hardly be worth the window provided to admit it, and the air which would be delivered from the windows of the lower rooms into those of the upper rooms would perhaps be hailed as a doubtful benefit. We should rather take our chance with a single ventilating flue of good size to each room. The rooms are necessarily small, ranging from eight feet by nine up to eleven by thirteen. The plans are on the whole ingeniously and compactly arranged, and, considering the restrictions of the case, may represent, apart from variations of detail, nearly the best thing that can be done. The question to which they lead is, How much is the best worth?

WE may assume, then, that to the judgment of the committee in this case, the best form for a tenement-house, in the ordinary conditions of New York, is a double building of four or five stories, with four tenements on every floor, each consisting of three small rooms *en suite*, the middle one of which is dark, and those which face toward the middle of the lot look upon dark courts of from five to eight feet wide, open to the air only at the top. This is not a very satisfactory conclusion, nor does the committee declare it to be so. The great stumbling-block is the necessity of making the thing profitable, in the degree in which real estate speculations in New York are expected to be profitable, to capitalists. To this end it was absolutely necessary to crowd as many rooms together as reason would allow. For this cause, all plans which allowed only one or two families on each floor were set aside without further consideration, says the committee in its report; on the other hand, some who provided for five or even six on a floor were ruled out as crowding beyond excuse. Having done this, and having fixed upon the four-family arrangement as that which best answered all the conditions, the committee wisely concludes, as far as making use of the customary New York lot of 25 by 100 feet is concerned, that, although many of the plans are an improvement on the existing tenement houses, "it is impossible to secure the requirements of physical and moral health within these narrow and arbitrary limits." It therefore urges that the only refuge is in enacting and enforcing laws which shall regulate the occupation, lighting, ventilation, and cleansing of such houses. In these conclusions most people who have no money staked in the question will be likely to agree with the committee. As the *Plumber* says, "With the license allowed to builders and landlords, no capitalist with a conscience can attempt to compete with unscrupulous and sordid men, whose sole aim seems to be to crowd the largest number of people under one roof, at the highest rental." The twenty-five foot lot is a hopeless element in the case, and if this could be eliminated it would probably still remain to enforce by legislation conditions at which competition should be possible to better-minded landlords. But such legislation would have to be carried in the face of an army of eager capitalists; and as for enforcing it, the power that does this will have to reckon with the people who live in the tenements, who are not fastidious, and will be easily persuaded that improvement of condition means increase of rent. These tenement-lodgers are a great army of voters.

APROPOS of this matter Mr. Henry Bergh has written a letter to the New York *Times*, in which he sets forth his own experience and conclusions in a way that is not encouraging. Some twenty years ago, for the sake of bettering the homes of the poor, he built ten houses in five stories, fronting on three streets, with a court-yard behind, laying them out for one family on a floor, taking pains to secure ample light and air, and putting gas-lights and oil-cloths in the halls. "For a while," he says, "these houses were the abodes of a cleanly and respectable people, but the handwriting soon appeared literally upon their walls, that they must succumb to the inevitable dominion of dirt, destruction, and disgrace. Their occupants destroyed the banisters, defaced the walls, blew out the gas instead of turning the faucets, and actually tore off the window-shutters to make fire of. Their children exercised their skill in whittling all that their knives would cut, and upon the jambs and doors of the entrances they carved every conceivable figure which savage taste could invent." The property depreciated, but taxes were not reduced; he tried to get a reduction of taxes or to rid himself of the property, but could do neither, and so the buildings "gravitated into a vast pile of unsightly edifices, the torment of their owner, and a perpetual bone of contention with the Health Department." The only remedy which Mr. Bergh can suggest is the radical one of forcing the tenement lodgers up the scale of living by legislation, insisting upon only one family on a floor, with plenty of windows and ventilated court-yards to the houses, and compelling the owners of existing houses to tear down partitions and open their rooms. When this is done it will be necessary, we fear, to provide also by legislation a class of landlords who will adapt themselves and their agents to the new order of things.

AN investigation of the trouble in the piers of the Hartford Capitol, and of the responsibility for it, is going on while we write. It is interesting for the people and legislature of Connecticut to know who is responsible, a matter which it seems difficult to come at; but for general uses it is more important to know what made the trouble, as a lesson which, in a time when a great deal of important work is done by very ignorant constructors, cannot be too widely known. It is in evidence, disclosed by drilling into them, that the stones of the granite facing of the brick piers were dressed to a joint but a very little way from the face, and worked off roughly behind, leaving large cavities to be pinned up and filled with mortar, — cavities which, however, do not appear to have been filled with anything, according to the evidence at the investigation and the account of our correspondent in another column, who says that nine tons of type-metal have been injected into the joints since they were partially closed by the settling of the piers. We do not clearly make out who ordered the change from the solid granite piers

which were specified by the architect to the brick piers faced with granite which were built; but most of the faulty directions are ascribed by Mr. Batterson, the contractor, to the late superintendent, Mr. Brown. The superintendent died during the progress of the work, and cannot defend himself here; if he was the father of all that is attributed to him, he was a superintendent whose demise can hardly have been a loss to the building which it was his duty to oversee. It was testified that after some of the stone-work had been set with mortar of the ordinary proportions and with quarter-inch joints, he ordered it taken down and reset with close joints and in mortar that was nine tenths lime. The brick cores of the piers, it is said, were laid in cement.

THE builder, or architect, who made the drawings for the change in the piers, declared that he expostulated with Mr. Brown, and was referred to General Franklin, who insisted on using brick. He had recently — since the injury appeared, we may infer — computed the weight on the piers. His computation and that of Mr. Upjohn, the architect of the building, which do not differ greatly, indicate that it was a rather hazardous thing to make the change, taking into account the way such work is apt to be done. No human foresight can tell how the ultimate stress will be divided between the different materials of a compound pier, and therefore greater caution is necessary in proportioning such a pier than a homogeneous one. Caution would dictate that if the weaker material were in excess the whole pier should be proportioned as if composed of that only; and that if the stronger were in excess there should be enough of it to do duty alone. According to the computations, the load on each pier was about three hundred pounds per square inch. Now brick, as ordinarily laid, should not be loaded with more than about a third of this weight, say a hundred pounds to the inch. The weight computed for the granite alone was about four hundred and fifty pounds to the inch. Good granite in the mass is ten times as strong as brick; but for granite as it is too commonly laid, with thin face joints, pinned up behind with small stones, and thickly bedded in soft mortar, it is difficult to say what strength can be counted on, — certainly not four and a half times as much as brick-work, one would say.

MR. CLARENCE COOK writes to the New York *Tribune*, lamenting the want of enterprise which allowed the Tanagra figurines, brought to New York by Mr. Feuardent, to be carried away to the Museum of Fine Arts in Boston, instead of securing them for the Metropolitan Museum. These figurines, about which General di Cesnola has also written a letter to the *Tribune*, are a collection of those which have been found during the last half dozen years in the ruins of Tanagra, a noted city of Bœotia, long since destroyed and deserted. The first were discovered in 1870 by peasants in the neighborhood, who, searching for building-stone, came upon old tombs which had not been opened. They were at first neglected, being of little value to plunderers whose only desire was for precious metals. After two or three years, however, they attracted the attention of archæologists, and a demand arose which raised the price of them to an extravagant pitch, and set the peasants at work with such effect that hundreds of tombs were opened in the search. In all the unrifled tombs they were found, two or three at a time, till two or three thousand of them have been discovered, first and last, the most of which have been secured for the various European museums, in London, Paris, Berlin, Vienna, and Rome; but there still remain many scattered about in the hands of private collectors and dealers. This collection, of a score or more, is the only one that has been brought to this country. It was expected that the Metropolitan Museum, having the Cesnola collection, to which this is a natural companion, would buy them, but while there was question of raising the fifteen hundred dollars which was their price, and apparently a doubt whether the Trustees of the Museum wanted any more antiquities, Mr. T. G. Appleton of Boston bought them and presented them to the Museum there.

THEY are small figures in terra cotta, only a few inches high, in a variety of attitudes and dresses. There has been some disposition to make them out deities, but without great success in identifying them. The character of their costumes, and a certain every-day look that they wear, makes it seem more likely that they are simply such naturalistic ornamental figures as it has been the habit of people of all ages to make for the decoration of their houses, and that they were buried with their owners, like other valuables, with no thought of special religious significance. They are ascribed to the fourth century B. C., and their special interest in the eyes of archæologists is that, unlike the admired relics of classical sculpture, they give us representations of the common costumes and habits of ordinary people among those who made them; and that they show the local peculiarities of what we may call a provincial folk at the height of the classical period of Grecian art.

THE modelling of the statue for the Byron Memorial in London has been finished, and the statue is shown before being put into bronze. It is the outcome of a competition which attracted a good deal of notice two or three years ago (see *American Architect* for July 15 and December 16, 1876). A very queerly managed first competition brought out some forty models, none of which were accepted, but the sculptors of six of them received the empty honor of an invitation to a second competition which, like the first, was open to all comers. On the second competition Mr. Belt was successful, and it is his statue that is now exhibited. It represents Byron sitting upon a rock, his head supported by his right hand, and his elbow resting on his knee, while his left hand holds a note-book and pencil. He wears his sailor shirt with open collar, his cloak is thrown over the rock, and his favorite Newfoundland dog is by his side. The figure is of "heroic" size, nine feet high, and the bronze will stand upon a block of Pentelic marble, presented by the Greek government, and fashioned into a pedestal ten feet high. Mr. Belt is a young sculptor and comparatively unknown, but has already shown some creditable work in a statue of Izaak Walton for St. Mary's Church, Stafford, and one of Charles Kingsley for Chester Cathedral, which he has been commissioned to duplicate for the Queen's private collection. His statue of Byron seems as little at home in London as its subject would be, if he could return thither, or as the obelisk was on its arrival; for there is great difficulty in finding out where to lodge it. The first intention was to set it in the Green Park, opposite Piccadilly Terrace; now it is a question whether it shall be at the head or the foot of St. James Street.

WHILE we have been talking of the need of training and cultivation among young architects and students, we have been reminded of one drawback which is a serious impediment to their learning all that they might be expected to learn in the course of their work. By the nature of their occupation, draughtsmen are kept at office work every day and all day, so that they are practically debarred from one of the most effective means for their education, the use of their eyes outside their offices. They seldom have a chance to watch the work which goes up about them, to study its character and effect in what is the most instructive way, by seeing it grow before their eyes. It is only by a rare chance that they are even able to examine the effect in execution of the work for which they have themselves made the drawings. If there are museums and collections about them which contain valuable materials for their study, they cannot visit them. This disadvantage naturally weighs most on those who are most efficient, because they are most continuously employed. It may be said that it is no greater confinement than befalls those who are practicing the beginnings of any other occupation; but it does indicate some hardship to learners whose due instruction depends on many things outside their immediate work, and it points a moral against the unwisdom of those who are in haste to get their whole training inside of offices. There are architects who make an effort to relieve this difficulty by giving their pupils and draughtsmen a half-holiday on one afternoon in the week, naturally on Saturday, and who say that it is made up to them in the increased interest and efficiency which it brings. Such an indulgence might not be possible when work was specially pressing; but there are many times in every office when it could be allowed without injury to the immediate work, and we are inclined to think something like it would be found to justify itself in most offices by the spur it would give to the activity and knowledge of those students, at least, who were willing to profit by it.

THE latest accident which can be laid to the charge of the shoddy builder is the fall on March 10 of the floor of Mechanics Hall at North Berwick, Me., during a town meeting. Thirty or more persons were seriously injured, some fatally.

THE OPEN FIRE-PLACE. VIII.

IMPROVEMENT IN THE FORM OF THE CHIMNEY THROAT.

THE next important step made was in the improvement of the form of the smoke flue where it connects with the fire-place. Cold air, being heavier than warm, will fall below the latter, and press it upwards to make way for itself. Thus the air in the neighborhood of the fire-place will press the hot smoke up into the chimney throat. If this throat is only large enough to take the smoke, hot air only will enter the flue and the draught will be rapid. But if the throat is larger than necessary, that part of the cool air of the room which enters the fire-place and becomes most heated by the fire, and next in buoyancy to the smoke, will, in its turn, be pressed up by the cooler air behind it, and enter the flue alongside of the smoke. Indeed, the entire volume of the air of the room, being warmer than the outside air, will tend to enter the flue with the smoke, so long as there be room provided for its entrance. The heat of the column, and consequently the rapidity of its rise, will therefore be proportionally diminished. For this reason the throat of the chimney should be contracted until it is no larger than is sufficient to carry off the products of combustion. A similar contraction throughout the entire length of the flue would be desirable, were it not that an allowance must be made for clogging up by soot, and for the resistance by friction to the passage of the air offered by the rough walls of the flue.

The first to recognize and apply this principle was Count Rumford (1796–1802). He published a number of valuable and interesting essays on various matters of domestic economy, one of which was devoted entirely to fire-places and chimneys. But he is to be blamed for not investigating or at least acknowledging the progress made by his predecessors in this particular. He says, "It is, however, quite certain that the quantity of heat which goes off combined with the smoke vapor and heated air is much more considerable, perhaps three or four times greater at least, than that which is sent off from the fire in rays, and yet small as the quantity is of this radiant heat, it is the only part of the heat generated in the combustion of the fuel burned in an open fire-place which is ever employed, or which can ever be employed in heating a room;" and again, "As it is the radiated heat alone which can be employed in heating a room, it becomes an object of much importance to determine how the greatest quantity of it may be generated from the combustion of fuel." Thus, however much good he may have done in improving the form of the chimney throat, and in calling public attention to the advantages of bevelled over rectangular jambs, he certainly also did much to discourage any further effort in economizing the waste heat of the smoke, and should therefore be considered as having really done more than any other one man to *retard* the proper development of the subject. He complains of the enormous waste of heat, and regrets that no means of saving it can be invented, in the face of the discoveries of both Savot and Gauger. Even his bevelled jambs for better reflecting the rays into the room had long since been recommended by Gauger. They were brought forward as quite new by Rumford. In speaking of the waste in unconsumed smoke, he says, "I never view from a distance, as I come into town, this black cloud which hangs over London, without wishing to be able to compute the immense number of chaldrons of coal of which it is composed; for could this be ascertained, I am persuaded so striking a fact would awaken the curiosity and excite the astonishment of all ranks of the inhabitants, and *perhaps* turn their minds to an object of economy to which they had hitherto paid little attention." Yet he gives no way of consuming the smoke or of alleviating the evil.

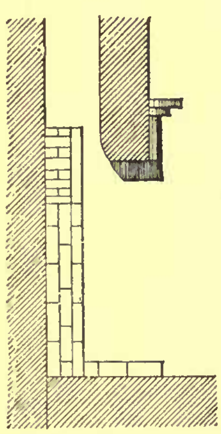


Fig. 49. From Peclet.

Figs. 49 and 50 represent the so-called Rumford stove or fire-place. He contracted the area of the fire chamber and gave the sides an angle of 135° with the back, or, which is the same thing, of 45° with the front of the fire-place, in order, as he said, to reflect the greatest possible amount of heat into the room. He considered the best proportions for the chimney recess to be when the width of the back was equal to the depth from front to back, and the width of the front or opening between the jambs three times the width of the back. These proportions are used to-day, and are undoubtedly the best. He objected to the use of iron for these surfaces on account of its great heat-conducting power, which wasted the heat and cooled off the fire, but advocated some non-conducting substance, such as fire-clay. He also objected to circular covings, on the ground that they produced eddies or currents, which would be likely to cause the chimney to smoke.

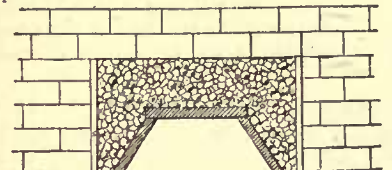


Fig. 50. From Tomlinson.

But his chief, or perhaps only, real improvement consisted in the reduction of the size of the chimney throat, and the rounding off of the lower edge of the chimney breast, as shown in Fig. 51, in order, as he said, to afford less obstruction to the ascent of the smoke. When the chimney required sweeping, the plate or flagstone opposite this rounded edge could be removed so as to open the throat, and be replaced after the operation. This form, as given by Rumford, is however still defective. The smallest part of the flue should be at the bottom, as shown in Fig. 52, so as to prevent the entrance into the flue of unburnt air from the room. From this point it should increase somewhat, to allow of a slight expansion of the heated column and to diminish its friction against the walls of the flue, as well as to allow for a partial clogging by soot and for the resistance to its passage offered by the roughness of the plaster. The back of the fire-place should also incline forwards, as shown, in order to increase its radiating effect as well as that of the flame.

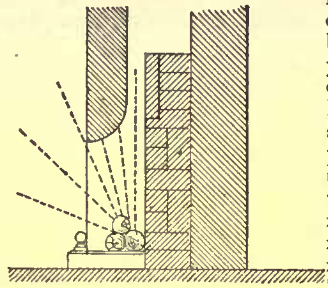


Fig. 51.

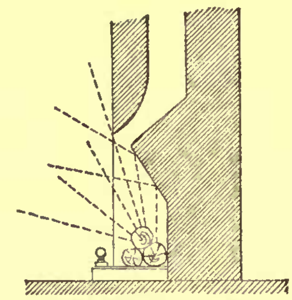
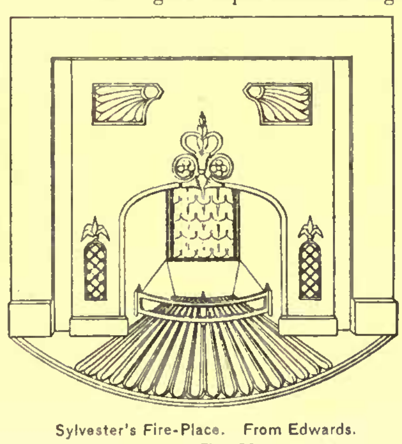


Fig. 52.

The simple and earnest style of Count Rumford's essays, the substantial nature of his acknowledged improvement, the facility with which it could be tested, and the enthusiasm with which he urges its importance, the detailed directions he gives for the guidance of the builder, and the liberality with which he offered the free use of his invention and services to the public, all tended to make a permanent impression, and not only to give the Rumford fire-place precedence over all others, but even to place the latter altogether in the shade. So much in the shade that, though infinitely more important as tending to improve the ventilation of the apartment, and the draught of chimney, as well as to save the waste heat of the fuel, they were almost forgotten, and, so far as the mass of the public is concerned, remain so up to the present day. So great was the influence of Count Rumford as a man of science, and his ability as a writer, that his failure to acknowledge the value of the efforts of his predecessors seemed like a tacit condemnation of them, and proved the severest blow to the cause.

Almost all modern grates are based upon the principles explained by Count Rumford, and a fire-place was considered perfect which was made in accordance with them. It was a rare exception when anything beyond this was thought possible.

The modern grate represented in Figs. 53 and 54, called Sylvester's patent, formed one of these exceptions, and was introduced about twenty years ago. In this the fire was put lower down than it had been at any time since coal became the staple fuel. The bottom of the grate was formed of separate bars, which extended considerably into the room. A curb of iron and a raised bar of circular form were used to enclose the bars and answer the purpose of a fender. The back and sides of the fire-place were formed of fire-brick. Instead of the register door above, Venetian plates were provided at the back of the grate for the escape of the smoke, which could be opened more or less by a touch with the poker. This grate is quite common with us to-day; but it is rare that we see it with the ventilating attachment shown in the figure, and operating on the old principle of the fire-place at the Louvre, described by Savot. The air from the room was warmed against the back and top of the fire-place, in the spaces shown in the section, and afterwards returned into the room.



Sylvester's Fire-Place. From Edwards.
Fig. 53.

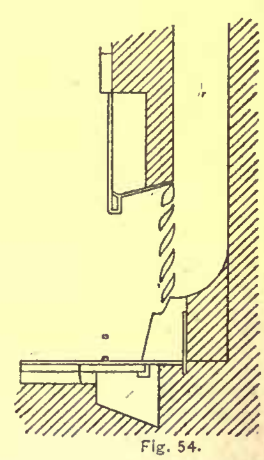


Fig. 54.

The contraction of the chimney throat by means of the Venetian plates, which could easily be regulated, was an excellent application of the principle advocated by Rumford. The projecting bars reflected considerable heat, but there were certain disadvantages. The

apparatus was necessarily expensive. It required more than usual care in setting. The fire was injudiciously low, and the necessity of removing the bars individually for the purpose of taking away the dust, and of then replacing them, was objected to from the fact that the operation was an unusual one, and one, therefore, which domestics were certain to object to.

Figs. 55 and 56 represent the so-called Stephen's grate. This

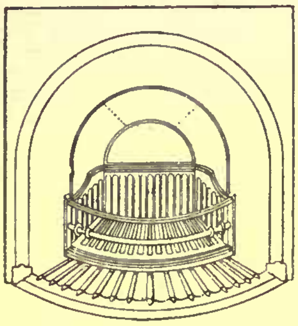
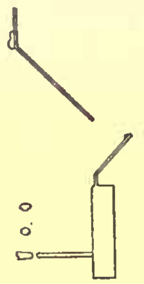



Fig. 55. Stephen's Fire-Place. From Edwards. Fig. 56.

has no ventilating flues. It was simply built after the Rumford principles, and may be taken as a type of what was and is considered a perfect grate or fire-place. As in Sylvester's device, the smoke passes away from behind, but through a single arched aperture instead of between Venetian plates. A polished surface of iron fills up the space between the aperture and the front of the grate. A pan to receive the ashes is fitted below the fire bars, and is made to project a few inches in front of them, where it is covered by an open grating. Fire-brick is used behind the bars to enclose the fire, and a door to move backwards and forwards is used to regulate the opening into the chimney. The iron-work is ground and stained black for dining-rooms and libraries, and is ground and polished bright for drawing-rooms.

Burnished steel and ormolu are introduced, of course, for those who can afford to pay for them, and the ash-pan itself is sometimes constructed of stamped and highly burnished steel bars, which, according to Edwards, the grate manufacturer, gratify the ladies by their brightness. Two curious circumstances attending the introduction of this grate are that it was not made of a semicircular form by the inventor, but elliptical, and that the notion was given over for a small sum of money to a manufacturer, who called it a patent, and retained the sole privilege of using it for many years, till it was discovered that there was no such thing as a patent in existence. Even before the introduction of Stephen's grate, another one, known as King's patent, and shown in Figs. 57 and 58, was introduced, which combined several similar qualifications, but only succeeded in becoming very little known. The form of the upper part was square in-

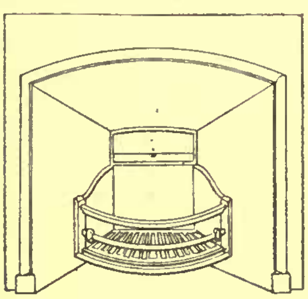
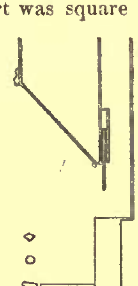



Fig. 57. King's Patent Grate. From Edwards. Fig. 58.

stead of semicircular, and the door at the back of the grate, instead of being suspended from the bottom, as in Stephen's apparatus, was suspended from above and balanced by chains and weights, so that a slight touch with the poker could move it up or down at pleasure, and increase or diminish the draught. This fire-place was, scientifically speaking, superior to Stephen's. The amount of reflecting surface was greater than in the semi-circular form, and the draught into the chimney was far more perfectly regulated than by the Stephen's door. It is curious to observe how instantaneously the draught is affected as the door is brought in proximity to the fire or is removed from it, and how perfectly all the products of combustion are carried off when the opening into the chimney is exceedingly contracted. The grate, however, failed to excite much attention for one reason, and one only, namely, that the square form was not at that time calculated to be so popular as the arched form. "It is," says Edwards, "of no use to attempt to reason upon matters of taste. It suffices to state that the arched form was at that time novel, and that few would look at any other. King's grate was subsequently made of the semicircular form, but not until the other had got the run, and it had become practically impossible to supplant it."

THE SLIDING BLOWER.

Soon after the improvement made by Rumford, Lhomond added a movable blower, as shown in Figs. 59, 60, 61, and 62, allowing the opening of the fire-place to be increased or diminished at will. In this way the entire current of air could be turned upon the fuel, and the open fire-place becomes transformed into a closed stove, so far as the concealment of the flame and the improvement of the draught is concerned.

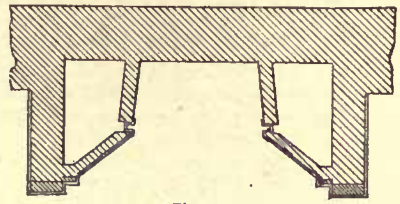


Fig. 59.

This is sometimes very useful with chimneys liable to smoke, especially when the fire is first lighted, and it is very generally used in Europe, especially in Paris. The blower is composed of one or more leaves of sheet metal, Fig. 60, sliding one over the other in the slots, as shown on the plan. The lowest is supported in the middle by a chain which passes over two pulleys, and is balanced by a weight. The use of these blowers is, of course, an effective cure for smoky chimneys, because it may be closed so as entirely to cover the fire, but it is an expensive cure, since it sends a part of the radiant heat up the chimney. It is true that the high conductibility of the metal plate allows heat to pass through it rapidly, but the loss is nevertheless very great when closed over non-ventilating fire-places. Its use is only to be recommended where no better means of preventing smoke is to be found, or where a powerful draught is required to light the fire rapidly.

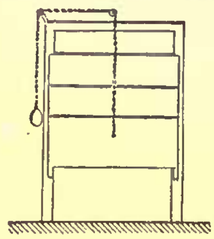


Fig. 60.

A good arrangement of the grate for burning coal is to have the entire grate project beyond the fire-place so as to utilize the greatest possible amount of radiant heat. A semicircular hood of metal over the fire would then serve to direct the smoke into the chimney. This hood, being a heat conductor, would also transmit a large portion of the rays of heat into the room.

The fire-place of Lhomond, as shown in Figs. 61 and 62, is designed

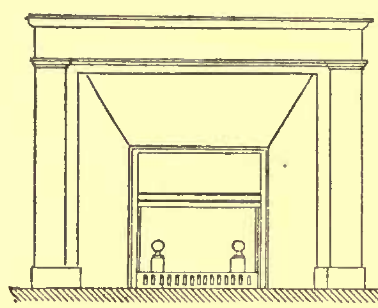
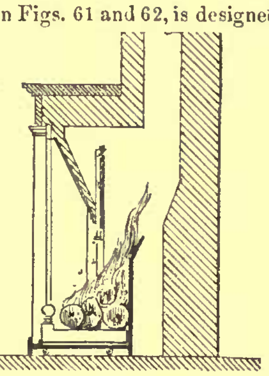



Fig. 61. From Peclet. Fig. 62. From Peclet.

for wood, but by putting a grate in place of the andirons it may be used for coal.

THE ILLUSTRATIONS.

UNITARIAN CHURCH, WASHINGTON, D. C. MR. R. G. RUSSELL, ARCHITECT, NEW HAVEN, CONN.

THIS church measures 59 by 90 feet, and has a vestry 26 by 72 feet. It will seat 550 on the main floor, and, including the gallery over the vestibule, it will seat 700 persons. The base and weathering are of brown Portland-stone. The arches are of Portland and Ohio blue stone. The walls are faced with Washington pressed brick, with some black brick, all laid in black mortar. The inside is finished with brown ash relieved with black walnut. The cost of the building completely finished and furnished, has been $40,000.

GRAMMAR SCHOOLHOUSE IN THE BRIGHTON DISTRICT, BOSTON, MASS. MR. G. A. CLOUGH, CITY ARCHITECT.

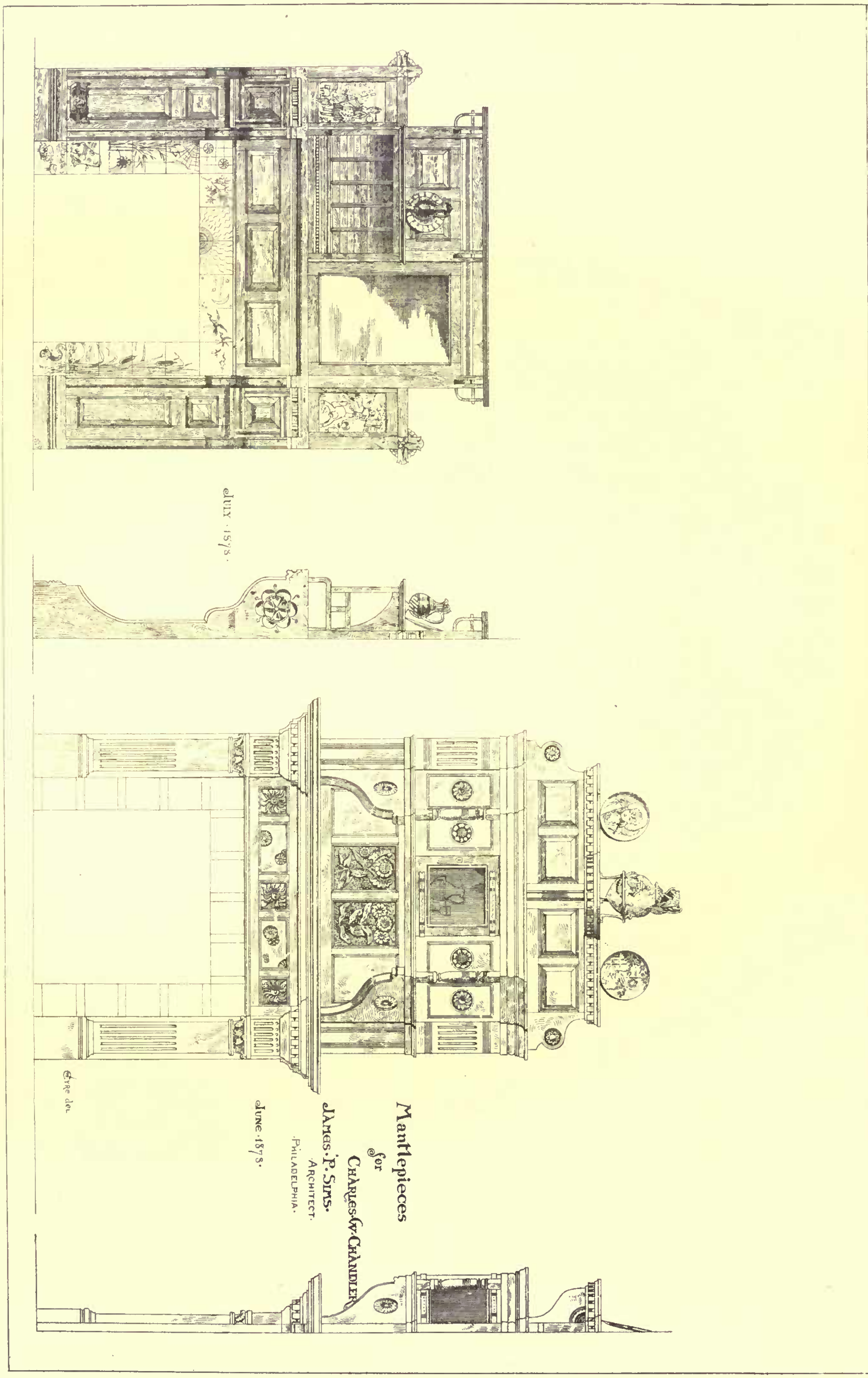
This school is intended for both girls and boys, and the separation of the two portions of the building, which in the first story is unnecessary for obvious reasons, is effected in the second story by an unpierced partition wall.

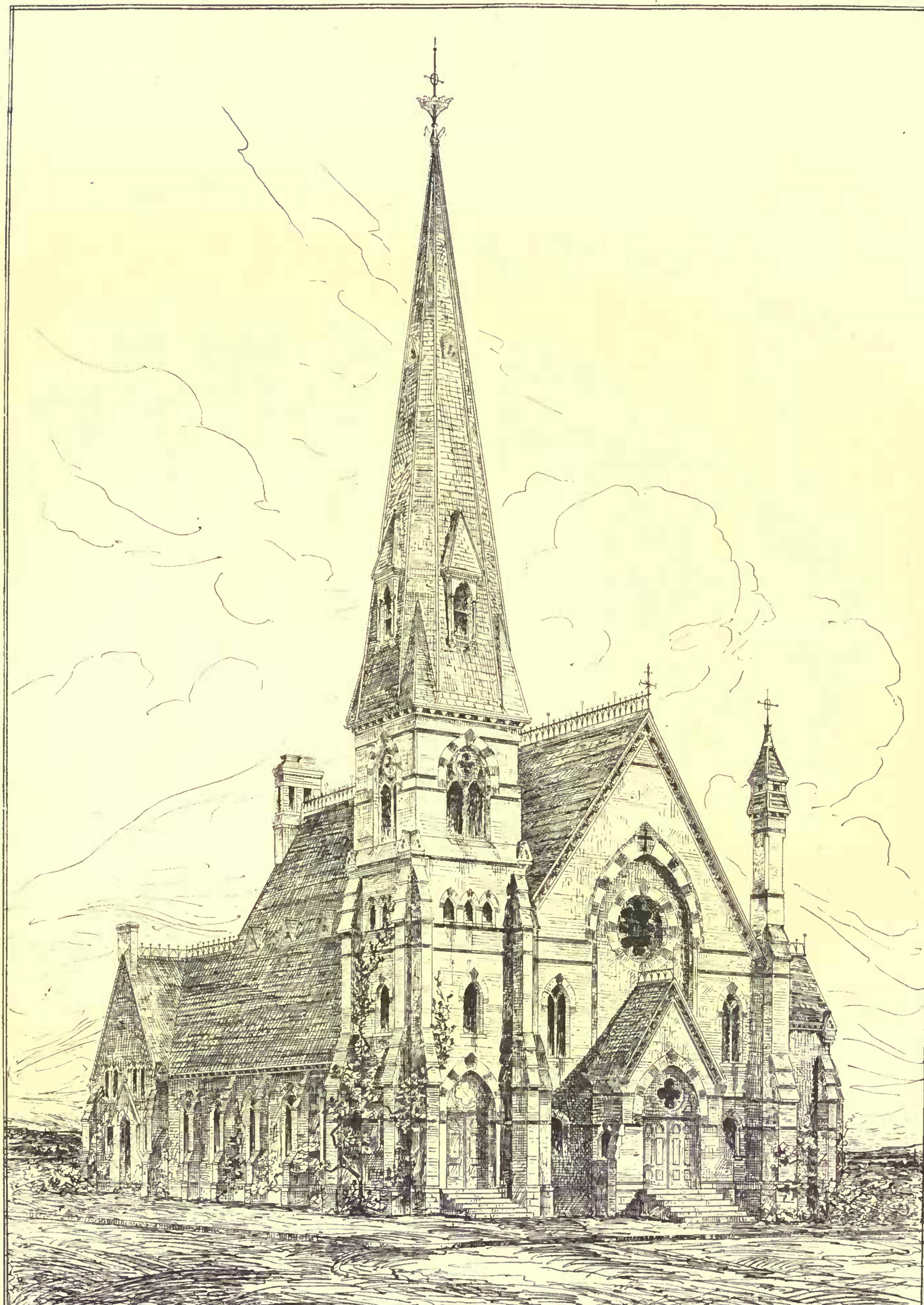
DESIGN FOR THE WASHINGTON MONUMENT.

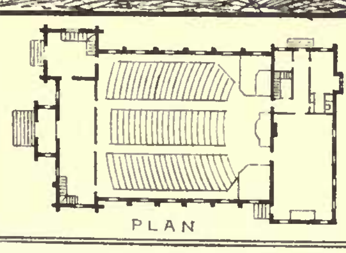
We print this week a design for the Washington Monument which has been sent us by an architectural student, and it occurs to us to suggest to other students that they will rarely meet with a better opportunity to try their powers of design. It would please us to receive the results of any attempts at the solution of this problem.

Of the design here published, which is evidently suggested by Mr. Story's design, the author says:

"The Gothic treatment adopted would allow one side of the base to predominate over the others. On the main front a large porch would enclose the statue of Washington, behind which the wall would be pierced by a large window; a door below giving access to the monument wherein are stairs and an elevator ascending to the summit. The other sides of the porch would be decorated with scenes from the life of Washington, in fresco or mosaic. The sides and rear of the structure would be treated, as shown, with niches for busts of

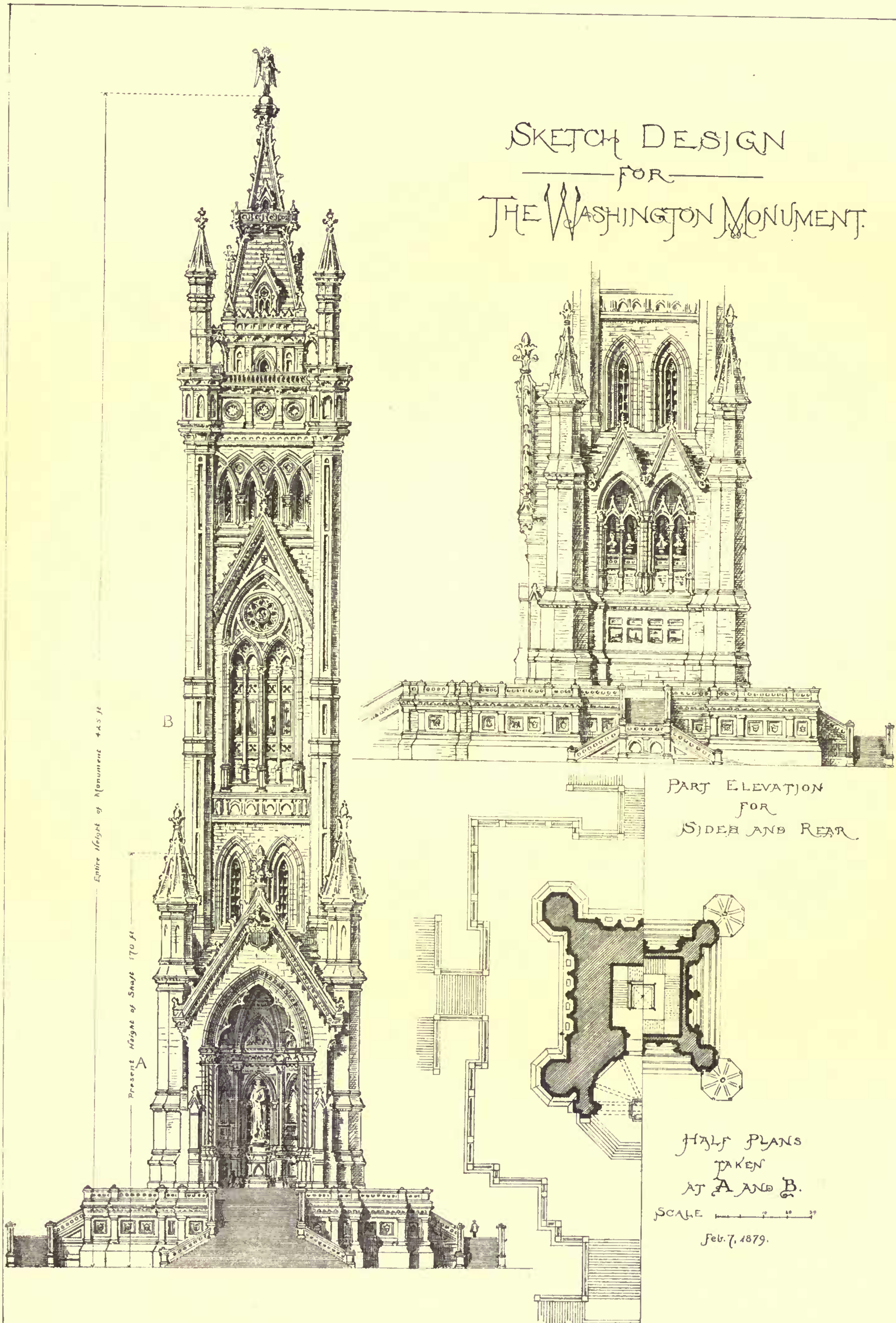

July 1878.
Mantlepieces
for
Charles G. Chandler.
James P. Sims.
Architect.
Philadelphia.
June 1878.
Eyre del.



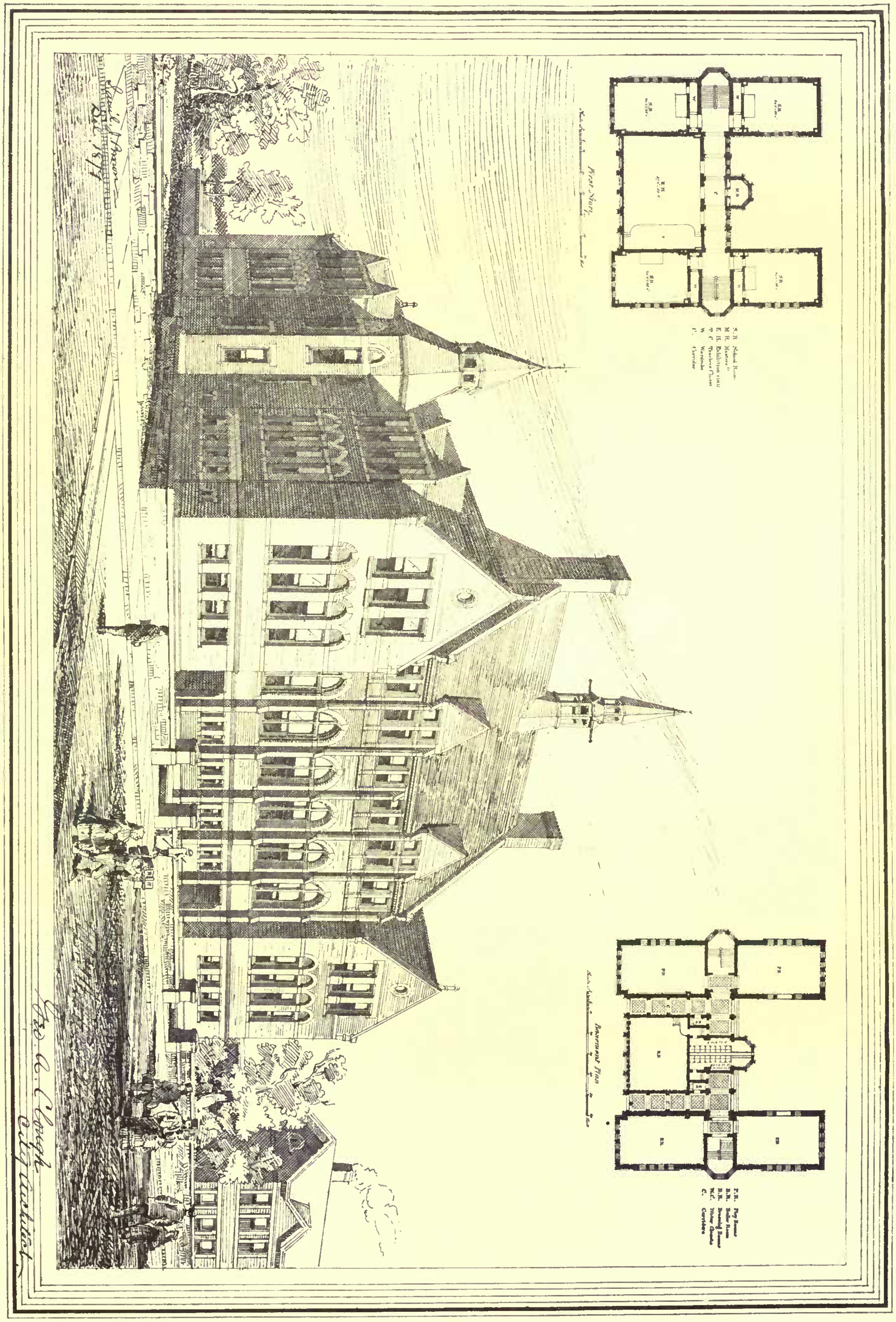


UNITARIAN CHURCH
WASHINGTON D.C.
R.G. RUSSELL ARCHT NEW HAVEN CONN
S.E. TOBEY DEL.
FOR HELIOTYPE

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON



The Heliotype Printing Co. 220 Devonshire St. Boston



GRAMMAR SCHOOL HOUSE — BRIGHTON DISTRICT

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON.

twelve Revolutionary heroes, while below would be panels representing scenes from the Revolution. Above, in the central division of the shaft, could be bas-reliefs representing the four sections of the country; in the gable over these panels could be placed the arms of the Washington family. The base of the monument would be twenty-seven feet above the ground, on a platform around which would be panels contributed by the forty-six States and Territories, carved with their respective arms."

MANTEL-PIECES FOR MR. C. W. CHANDLER, GERMANTOWN, PENN. MR. J. P. SIMS, ARCHITECT, PHILADELPHIA.

These mantels are built of oak wood.

THE PLUMBING IN A FIRST-CLASS BOSTON HOUSE.

II.

PASSING from practical to experimental sanitary work, those who have constantly presented to them the problem of the efficient drainage of country houses may take an interest in the details of an attempt to carry out the Moule system of subsoil irrigation, as described by Colonel Waring in his papers in the *Atlantic Monthly*, and noticed by several other writers.

The house to which the system was applied stood at the upper side of a plot of about half an acre, sloping quite rapidly to the northwest. Both the owner and the architect had been interested in the descriptions of the system, and were desirous of trying it, and the sloping ground seemed to give a favorable opportunity, as affording space to lay the outlet pipes close to the surface, without any fear that the waste water could back into the house if they should be frozen or clogged, which seemed the chief danger. With the kind assistance of Colonel Waring, the scheme was laid out as follows: Just outside the basement wall, an iron Field's flush-tank was sunk some four feet below the surface. Over the grating of this discharged the wastes of kitchen and pantry sinks, wash-trays, and bath. A wooden box, brought up to the surface, with a cover, gave access when required. The drainage of the wash-bowls was led away by a separate pipe, to lose itself in a trench filled with broken stone at another part of the plot, while the soil-pipe from the water-closets discharged into a separate drain, which joined that leading from the outlet of the flush-tank about twenty-five feet from the house. The two drains, one from the tank and the other from the soil-pipe, after joining continued some twenty-five feet farther down the hill to a tight circular cesspool, five feet in diameter and five feet deep, of hard brick in cement, sunk so far as to bring the crown of the dome about one foot below the surface. The land inclined so much that the cover of the cesspool was below the outlet of the flush-tank, so that any accumulation of water in the pipe, caused by a stoppage beyond, would, by the time it reached the tank, lift the cover off the cesspool, and the subsequent additions would flow away harmlessly over the surface of the ground below, without the possibility of its backing up into the house. This seemed at the time a wise precaution, but experience shows that it was quite unnecessary. The brick cesspool as a part of the system was rendered essential by the introduction of the soil-pipe drainage, which could not enter the flush-tank, and yet required a place of storage, where solid matters or substances likely to choke the subsoil pipes might settle or gradually dissolve. The soil-pipe was without trap of any kind, and half a dozen holes drilled in the stone cover of the cesspool served to admit air to the whole length of the soil-pipe and drain. A four-inch outlet pipe was built into the lower side of the cesspool, about four feet below ground, and continued nearly level, with water-tight joints, obliquely down the hill, until the fall of the ground brought the pipe within sixteen to eighteen inches of the surface. Then the line was continued by a succession of Y-branches forming a curve, such as to give the pipe a grade of about one quarter of an inch to a foot, but keeping it everywhere at the same distance below ground. From the unoccupied branches of the Y's, lines of two-inch unglazed pipe-and-collar land drain were carried back, making an acute angle with the main line, and curving around the outline of the hill so as to describe almost a series of contour lines, except that the pipes were laid to a slight inclination, one inch to twenty-five feet, and the extreme ends of the lines were brought very near the surface, — within eight or nine inches. Three hundred feet were laid in this manner, in nine or ten parallel lines, the trenches filled in, and the place sown with grass seed.

The whole arrangement worked perfectly through the autumn and winter. In the spring, the ground was dug over for re-planting, and advantage was taken of the opportunity to examine the pipes and see what condition they were in. By this time the water had begun to make its appearance through the ground at the ends of the lines of pipe. All the rows stopped close to a fence, and the open ends being near the surface, and in loose, newly-graded soil, the liquid had found its way out, and had worn a channel through which a little stream trickled away and disappeared in the grass on the other side of the fence. At its first appearance, where the ground was almost without vegetation, a certain amount of smell could be perceived, but where it ran among the grass there was nothing of the kind. The water from the pipes was rather milky, and wherever it rested for a time it left a blackish scum, but the quantity was very small in proportion to the volume of water. On exposing the lines of pipe, it was found that a similar scum had accumulated wherever there was any check to the flow. The lower end of the chain of Y's had been cemented tight, and these having been laid with considerable pitch, the lower portion formed a kind of pocket, and the liquid reaching the end was obliged to turn back on itself to get into the outlet pipes. This turning back of the current had led to a considerable deposit of sediment, so that the last two or three Y's were completely filled with black mud, which prevented the water from getting into the lines of outlet pipe which connected with them. In one or two places, also, the open-jointed pipes had not been evenly laid, or had settled, and the water lingering in the depression had also thrown down a slime sufficient to partly fill the tube; but wherever the flow was unobstructed they were washed perfectly clean. The clogging of the soil which had been anticipated was found not to have taken place in the slightest degree. Whether the oxidizing action of the air so near the surface had destroyed the organic matter as fast as deposited, or the flush-tank and the settling cesspool had together been able to keep back the slime which so soon clogs the ordinary leaching cesspool, may be a question, but it is certain that the soil, which was a compact marl, retained hardly the slightest trace of the 20,000 gallons or so of sewage which had been discharged through the pipes.

When the pipes were relaid, the lines were left open, to watch the absorption by the soil in the bottom of the trenches. The slight flow which constantly trickled from the flush tank was taken up immediately, and the discharge of the whole tank by means of the siphon, which took place about twice a day, remained not more than five to ten minutes in the trenches before being entirely absorbed. In the relaying, additional trenches were made, and about one hundred and fifty feet more of pipe put down. The Y's were cleaned, and the last one, instead of being closed, discharged directly into one of the new lines of pipe. The grade was rectified and the trenches inspected to see that the outflow from the joints was uniform throughout each line. The collars of the original pipes fitted very tightly, so that the flow through some of the joints was almost nothing; in relaying, the collars were for the most part omitted, and the new pipes were ordinary sole tile without collars. To guard against the bugbear of the pores of the ground becoming filled, as well as to save the pipe from displacement, a row of small stones was put on each side before covering in. The whole has since continued to work well.

Of the agricultural value of the system, it was impossible to judge, as the ground under which the pipes were laid was poor, and had just been rather thinly sown with grass, but that the liquid had some fertilizing properties was shown where it escaped from the surface and trickled through the fence. Here it lost itself in a patch of grass which reached an enormous growth, one root among many having sent up twelve stalks each over six feet in height.

The perfect practicability of this mode of drainage in so exposed a situation still needs to be tested by a winter more severe than the last, but wherever it can be applied, the advantage over the leaching cesspool seems very considerable. The cesspool, in all but the most open soils, is certain to get clogged before many months, and the cleaning out is as troublesome and costly as the cleaning and relaying of a whole system of pipes, and is horribly offensive, while the smell from an exposed row of pipes is almost nothing, and can be wholly subdued by a few handfuls of earth. The stoppage of the pipes if properly laid is probably impossible. It must be considered that the area of outlet in five hundred feet of pipe laid one sixth of an inch apart is five hundred square inches, or nearly one hundred times the capacity of the drain which supplies them, while the area of soil presented to the current, supposing the tiles surrounded by dense clay, so that the water could only creep along the sides of the pipes, would be three hundred and seventy-five square feet, or about six times that available in an ordinary cesspool, while a few stones along the sides of the pipes would double even that. Moreover, if a stoppage should take place in all the pipes, it would be extremely gradual, joint after joint being closed, and the taking up and relaying of five feet of pipe would again give an outlet equal to the inlet, while a cesspool chokes all at once, and the first intimation of trouble is given by finding ten to a hundred gallons, the amount of the emptying of a wash-tub, or a flood of surface-water from a heavy rain, poured out over the basement floor; and the whole annoyance and expense of a thorough cleaning must be endured before the drains can be used again, while only assiduous disinfecting will ever make sweet again a cellar once soaked with sewage. As to the theoretical virtues of discharging the house-waste within reach of the air contained in the surface soil, it is only necessary to refer to any book on sanitary engineering; we have also to consider the convenience and the relative expense, as well as the probable defects, of the different methods which it is possible to employ, and a little relation of practical experience may be useful to many who hesitate to spend their clients' money on devices which they know only through the glowing descriptions of sanitary reformers.

CORRESPONDENCE.

THE TENEMENT-HOUSE PROBLEM.

NEW YORK.

IN press and pulpit, at public meeting and on all sides, general attention is now turned to the tenement-house problem. The charitable workers have had the fact forced upon them that an overwhelming proportion of our city crime finds its origin in the tenement-house districts. The church workers find that they make no head-

way against this great wing of the population. The police complain of it. The Building Department shrugs its shoulders and keeps on granting permits for such buildings. The Health Board uses it when startling lessons are to be vividly illustrated by facts and figures, with arrays of hospital cases and high death-rates. Other cities have their figures paraded in comparisons with those of the metropolis, and altogether it makes a picture dark and dreadful enough to discourage the most sanguine; and then suddenly comes up the cry from the super-charitable enthusiasts, Let us abolish the tenements! and the cry is taken up as the great discovery of cure. But this short-cut solution of the difficulty, embodied in the recommendation to sweep the tenement-house out of existence, is predicated on a false basis and is sustained by facts drawn only from one side of the picture.

The tenement-house is peculiar to New York, of all the cities on this side the Atlantic; those great packing-boxes of humanity, where in mere cupboards of rooms families are supposed to build up for themselves a home life, are essentially a metropolitan institution. They are of course to be found in Jersey City and in Brooklyn; but New York retains the choicest specimens of overcrowded, underventilated rookeries, and it is here that the rise and growth of the system must be studied.

This class of houses was not forced upon the people, and those who occupy them are not the loudest class of grumblers. They do not complain, since they know no other existence, and hence have no personal experience by which to measure their comparatively miserable living. I say comparatively, for it may be the fact, that for many of these tenement occupants, to force them into other habitations would only make them active malcontents instead of the present patient sufferers. The longer the problem is studied the more complex it appears, and it would seem finally to narrow itself down to the question of how much the property owners must individually sacrifice for the general good. The tenement-house population, startlingly large as it is in the aggregate, has but little choice, as it has but little money, and so can be considered only as an inert factor in the problem.

The growth of the tenement-house had its origin within a generation. Gotham Court, in Cherry Street, the first of the breed, is yet standing. There was then rushing into the city a great flood of foreign immigrants; of course they had not come from tenement-houses, but they came with habits of life which found adaptable surroundings in the poorly-designed houses then built. The income from this class of property was satisfactory, and investments flowed that way; land which would pay in no other way brought good figures when covered with tenements, and the system grew until now over $200,000,000 are invested in this way. The time has now come when the people of the city, those who live and have homes, and do not merely exist and find shelter in a corner of a tenement, must take hold of the matter. The city is cultivating an element of weakness; it is harboring places of vice, festering spots of fever, and nurturing a dangerous class of the population which already holds the balance of power at the ballot-box.

It is not fair to say, however, that under the exact conditions of powers and people as we now find them, anything better than the tenements of to-day could have been expected; given, the average city lot 25 by 100 feet, given the necessity for a net revenue, under a heavy tax assessment of from six per cent upwards, and given a population who will not turn even so much as a little finger to make themselves one whit more decent, and you reach the inevitable result of a New York tenement-house. There are tenements in this city where order, thrift, cleanness, are to be found. They are neat and cheerful homes, and in each suite of apartments may be found as much real domestic bliss and decency as in the most expensive of the Albany or Newport flats in the more aristocratic quarters of the city. The rent is low, but the people have sufficient moral force, enough of cleanly habit, to enable them to make the best of their surroundings, and these surroundings are exactly adapted to a snug, moderate style of living. The tenement-house may, beyond doubt, give opportunity for all the squalor and indecent contact which the philanthropists so much deplore; but it also gives chance for the cultivation of kindly social companionship, and of helpful acquaintance on an humble scale; of the 21,000 tenement-houses in the city, a vast majority are of this latter class, or we should be living in a very Bedlam indeed. It is idle to talk to a tenant-house owner of sacrificing one tittle of his income for tenants who come to him with all sorts of promises, who hire a set of apartments "for a small family," and then take in a half dozen or more boarders, men and women, to "aise the rint," and make night and day one long orgie over potations drawn from the gin-mill on the first floor, which, perhaps, was hired nominally as a grocery store. Is it any wonder then that such an owner turns the control of his property over to an agent who goes, at intervals, well armed and well camphored to collect the stipend of rent? The same classes live in exactly the same state in the cabins scattered in the squatter settlements in the upper parts of the city. I venture the assertion that were but a tenth part of the energy spent in personal work at the tenements that is now exhausted in writing pamphlets, the evil could be mitigated into insignificant proportions. The experience of Mrs. Dr. Mills with the tenement 41 Park Street can be duplicated and reduplicated a thousand fold. Taking a single house of the worst class, this lady has by a few rules made of it a habitable place; she has taught her tenants how to live, and supplied the brains which they lack.

The committee now having the matter in charge might do some good by forming a company for the erection of tenements on a large scale, ignoring entirely the 25 by 100 feet size and securing that pure air, pure light, and that sufficiency of room for domestic privacy and purity which are the outward remedies for much of the evil, for all the trouble, indeed, except the vile man who inhabits these houses. Architects have done their best with the problem in all its limitations, and that best is the tenement-house of to-day. Unless the lot limit is abolished, unless rents are raised, or lower profits are acceptable, nothing better than the house of to-day can be devised; but here again it is worth while to see whether our present remedies are properly employed, for it is beyond doubt that some of the most offensive features of the present tenement need but the application of the present laws for their removal. The Board of Health have it within their province to remedy bad drainage and ventilation, and to purify foul sinks and closets. If the members of that board do not care to take the risk of rousing their political enemies by a vigorous enforcement of that power, the public must suffer. The Department of Buildings might make many a dark hall-way light and place many a window where none now exist, were its superintendent not too ready to keep on terms with the speculative builders of these houses; and if there is crime hidden in these great caravansaries, if the visitors can so readily find illegal tippling and gaming-places, acting as the moral plague-breeders in tenements, the police may find them as well, and put a short stop to them. But while the Police Department waits to have vice thrust into its face before applying the strong arm of the law to it, little aid can be looked for from that quarter. The trouble is not in the lack of laws, but in the lack of energy in executing the laws we have.

W.

THE STATE CAPITOL.

Hartford, Conn.

The wrangle over the foundation piers of the drum and dome of the new Capitol building is creating no small excitement in Hartford, and all sorts of wild stories are afloat about the trouble. Narrowed down, it simply serves as another illustration of the folly of having an architect fill merely the post of a designer, without having the power of enforcing the proper carrying out of his plans and specifications. Mr. R. M. Upjohn, of New York, who has won such credit for the excellent taste and architectural skill shown in the building, went no further than the preparation of the drawings. The specifications provided that no changes should be made by the contractor without the written consent of the commissioners appointed by the State, and they were represented on the works by a resident superintendent. Mr. Upjohn made frequent visits to the site, but it was in the character of an adviser to the commissioners, and his directions carried hardly more weight than those of any other visitor.

There have been rumors of danger below ground. One had it that the tower and dome were settling and in danger of a fall, and that extensive alterations would be necessary. Another report made the danger still more imminent. Certain it is that the basements have been very carefully guarded against the intrusion of the curious, and when a short time since a sharp explosion was heard the excitement ran high. Both branches of the legislature have appointed committees of investigation, and much testimony has already been taken.

The trouble is with the piers supporting the tower upon which the stone dome rests. There are ten of these piers, six of them nine by seven feet in area, and the others of smaller dimensions. The specification required them to be built entirely of granite blocks in two-foot courses, and the drawings show the line of the joints in such way as to show three sides at least of every stone. With this there could not well be chance for improper bedding. To save a few thousand dollars the piers were changed to brick cores, faced with granite ashlar, and the joints being at shorter intervals gave opportunity for cob-castle building which was eagerly taken advantage of. The contractor now fails to show any written orders for the change. Mr. Upjohn did not see it until it had been made, and, knowing that abundant strength would be had if this mode of construction were properly carried out, made no remonstrance; nor was it his province to do so. In November last the dome was completed, but in October the edges of the granite ashlar work began to crack and the stones were badly spalled. A glance told that the stone had not been properly bedded, but instead had merely a face tooled on, and then by pinning up the work was made to look fair. It was, in short, as bad a piece of scamped work as ever was turned out. The contractor now declares that Mr. Brown, the superintendent for the commissioners, directed this style of work. But Mr. Brown is dead, and says nothing in rebuttal of this extraordinary assertion. The whole trouble lay in this single story of ten feet of granite facing. Above it was $800,000 worth of work. It would be well-nigh an impossibility to raise such a structure and rebuild the piers. Mr. Upjohn then suggested the tamping of the open beds with metal. Holes were cut along the joints and the interior spaces dried out by currents of hot air, after which molten type metal was run in. Some notion of the extent of the bad work may be had when it is stated that nine tons of metal have been used, and the cost of the repairs will reach $20,000. The present contractor, if he can shift the responsibility of the bad work upon the dead Mr. Brown, may escape the penalty of paying for the repairs, and thus force a payment out of some contingent appropriation.

A calculation shows that the greatest weight upon the smallest bearing surface is 232 pounds per square inch, and the greatest pressure upon the largest sectional area is 173 pounds per square inch. The depth of the granite ashlar is one foot nine inches, or, taking eighteen inches for a basis of calculation, and supposing the whole weight to come on the granite, a crushing strain of 364 pounds per square inch would bear on a surface of 52,704 square inches. Had the work been properly executed, and assuming 15,300 pounds per square inch as the crushing weight for granite, the actual strain would have been less than one fortieth of the real strength. The whole sectional area of the piers was 82,651 square inches, and so according to the original plans the weight of 9,597 tons above the piers was amply provided for by Mr. Upjohn. That the commissioners thought proper to set aside the directions of that gentleman is the mistake for which somebody, probably everybody, in Connecticut will now have to pay. The brickwork above is without crack or crevice, and but for this bit of rascally work the building deserves all the praises for honest work which have been lavished upon it.

J.

RESOLUTIONS IN MEMORY OF THE LATE R. G. HATFIELD, ESQ.

At a meeting of the Trustees of the American Institute of Architects, held at the rooms of the Institute on Wednesday morning, March 5, the following minute was unanimously adopted, and ordered to be entered upon the records of the Institute: —

"The Board of Trustees, assembled for the first time since his death, desires to express in a public manner its sense of regret at the loss which, through the death of its chairman, R. G. Hatfield, Esq., the Institute, the architectural profession of this city, and the public have sustained.

"To Mr. Hatfield's untiring interest in the conduct of the affairs of the Institute, a large measure of its success and influence was due, and his able and honorable practice of architecture has had no small weight in establishing the position which the profession now enjoys.

"The Board of Trustees gratefully calls to mind the fact that all Mr. Hatfield's intercourse with its members have been marked by uniform courtesy, and that his temperate counsel and consideration had won from them an unqualified regard and respect."

The Secretary is, hereby, instructed to enter the above minute upon the records.

A true copy from the minutes of the Board of Trustees of the American Institute of Architects.

Henry M. Congdon, Secretary.

AMERICAN INSTITUTE OF ARCHITECTS.

BOSTON CHAPTER.

At the regular meeting for March, President Cabot in the chair, there was a discussion upon certain resolutions submitted by the executive committee regarding the extra assessment levied by vote of the last annual convention. An order was passed to pay this assessment out of the funds of the chapter, and the following resolutions were ordered to be sent to the Secretary of the Institute.

Resolved, That the Boston Chapter, on paying into the treasury of the Institute, on account of the assessment levied by vote of the last convention, the sum of four dollars for each member of the chapter, desires to express its conviction that such assessments are at present inexpedient, and cannot fail to be a great injury to the Institute.

Resolved, That the separate publication of the proceedings of the Institute seems, for the present at least, to be inexpedient in view of the expense of such publication, and of the fact that they would be acceptably presented and extensively published in the columns of the *American Architect and Building News*, without expense to the Institute.

A committee was appointed on motion of Mr. Preston to consider the expediency of encouraging in some way the recording by careful drawings of the archæological remains in Massachusetts, having in view especially old houses and other buildings of an architectural character. The committee has orders to report at the next meeting.

After the transaction of other business, a paper entitled Notes on Contracts was read by Mr. Theodore M. Clark.

A GOVERNMENT TESTING MACHINE.

The New York *Times* says that Mr. A. L. Holley, at the recent session of the Institute of Mining Engineers, in Baltimore, described substantially as follows a testing machine of extraordinary power and range: —

The 400-ton testing machine, ordered in 1875 by the United States Board to test Iron, Steel, and Other Metals, has lately been completed at the Watertown Arsenal, thoroughly proved, and accepted by the board. The proof experiments were numerous, and the results fairly astonishing. A forged link of hard wrought-iron, five inches in diameter, was slowly strained, and broke short off with a loud report at a tension of 722,800 pounds. That the weighing parts of the machine were not disturbed by the recoil was proved by testing a horse-hair. It stretched thirty per cent, and broke at one pound. Specimens were also subjected to 1,000,000 pounds compression, and in every instance the machine gave admirable satisfaction. The inventor of this wonderfully accurate piece of mechanism is A. H. Emery. It cost the government $25,000, but it cost the contractor over $100,000.

Briefly described, the machine consists of a double-acting straining cylinder and ram on a carriage at one end, and a movable weighing apparatus at the other. The two are connected by a pair of eight-inch screws forty-eight feet long. Nuts, driven by shafting, move the straining cylinder to different places on the screws, so as to test long or short specimens of metals. The weighing apparatus is simply a reversed hydrostatic press, having diaphragms instead of pistons. The load is transferred by means of a fluid, — alcohol and glycerine, — by a series of large diaphragms to a series of small ones, and finally to a system of scale beams. Thus, a weight of 800,000 pounds, acting through a very small space, moves a finely graduated indicator at the rate of one hundredth of an inch to the pound. The steam-pump and the accumulator have cylinders and weights respectively for high and low pressures, and the machine receives pressure without pulsation from the accumulator only, when testing. The metal in the machine weighs 175,000 pounds, and includes pieces of 14,000 pounds, down to those of which 250,000 would weigh only one pound.

The importance of a testing machine of great power cannot be overestimated. Constructors are beginning to find out that it is not safe to predicate the physical qualities of large bars on those of small ones. One might as well exhibit a brick as the measure of the strength of a wall. A testing machine that will take in a whole bridge-post, and subject it to a regularly-increasing stress up to the point of destruction, is capable of developing structural defects, as well as the physical qualities of materials. The United States testing machine can apply 1,000,000 pounds compressive stress to metallic specimens of any length up to thirty feet. It is an engine of power and precision, in which lie the possibilities of a revolution in the manufacture of iron and steel and bronze, and in the proportioning and adaptation of structures. Congress, however, from some unknown cause, fails to realize the importance of the work of the board under the auspices of which this machine has been constructed, and now refuses to appropriate the money to make it available. It has refused to continue the board itself after the 30th of next June, and it has removed the custody of the machine from the board to the Secretary of War. If the Government would act with liberality in this matter, and furnish the requisite money for the use of the board to test the materials for bridge and ship building, it would find in the end that it had taken a step toward real, substantial economy. The enormous excess of material which loads down bridges with their own weight would be done away with, money would be saved, and the bridges would be safer. A tenth part of the money paid yearly in damages for railroad accidents, if apprppriated by Congress to preventing them by a proper system of tests, would be saved to the people, to say nothing of the lives which would be saved. But Congress does not feel authorized to expend money in this helpful direction.

The labors of the board, which will conclude next June, have been faithfully performed. It was authorized to spend $15,000 for its own expenses; it did spend $2,248.79. The remainder of the appropriation was devoted to testing experiments. A large range of investigation has been covered, and the results tabulated. A complete chemical laboratory has been set up at the Watertown Arsenal, and Andrew A. Blair, late chemist to the board, has made two hundred and thirteen analyses of iron and steel, and two hundred and forty-nine of alloys. Commander L. A. Beardslee, United States Navy, has made the most exhaustive series of experiments ever recorded on chain cables and wrought-iron generally. Professor Thurston has made a complete series of experiments on bronzes. Chief Engineer David Smith, United States Navy, has made an elaborate series of experiments on tool steels, and Gen. William Savy Smith has devoted his attention to making some important tests of beams.

THE VIRTUE OF WATER-SEAL TRAPS.

In a note with the above heading (*American Architect*, vol. v., p. 72), we are informed that Mr. Buchan's experiments "seem to show that, after all, there may possibly be more protection in a water-seal trap than is usually believed nowadays."

Mr. Buchan found that gases pass through water without difficulty, but his attempts to cause ferment germs to pass through water have failed. This does not affect the question in the least. The ferment germs, which are supposed to reach us through the agency of our sewers and drains, are germs whose increase is fostered by the presence of putrescible organic matter. It is accepted as a fact that in the case of perfectly clean sewers and perfectly clean house-drains, we have nothing to fear from this source. It is believed that our danger comes from the multiplication of the germs of disease in connection with the decomposition of organic wastes; that, the parent germ being introduced, it increases in the foul medium with which it comes in contact, — a suitable medium leading to a rapid increase with the usual escape into the surrounding air. It may very well be that the *transmission* of germs is prevented by a water-seal; but if, as is almost invariably the case in practice, the water-seal contains decomposible organic matter, its exposed surface being in contact with the air of the drain, the germs contained by that air will plant themselves in the inviting soil, will grow and multiply throughout its mass, and escaping with the exhalations at the house end of the trap, will continue their growth along the slime-coated pipe and become as abundant and active as though no trap had intervened.

George E. Waring, Jr.

COLEMAN COUNTY (TEXAS) COURT HOUSE.

Topeka, Kansas, February 27, 1879.

To the Editor of the American Architect:

Sir,— Referring to the criticisms invited upon the Coleman Co. (Texas) Court House, I find the weight of materials alone to be 16 pounds per square foot, making a weight of 10,062 pounds equally distributed over each beam. Supposing the beam to be full 7 by 14 inches and not weakened by the cutting on the sides, its breaking weight is 32,812 pounds.

With a load of 175 pounds added to the weight of construction, provision must be made for sustaining a load of 335 pounds to the superficial foot. Leaving the conditions the same, and assuming the breadth to be seven inches, I find the depth required to be 16.69 inches, which proves the work to be unsafe. In the absence of a scale, I judge the available thickness of the timber to be only four or five inches, on account of the cutting, which makes it weaker by about one third. L. M. Wood.

MODERN CHURCH BUILDING.

Baltimore.

The writer of the article on "Modern Church Building" has certainly misapplied the title if he considers it an exhaustive treatment of the subject; for commencing by the broad classification of the religious world into "Catholics and Ritualists" on the one hand, and "the remaining Protestant sects" on the other, he proceeds to speak immediately and exclusively of the building which, he states, is suited to the latter class. Recognizing the many faults of acoustics, etc., too often found in all our churches, it is to be observed that he comprises in "the other Protestant sects" a vast body of Christians all over the world (including the larger portion of the Protestant Episcopal Church of England and of America), with whom the correction of this fault is not the only desideratum in their churches, and whose services are not dependent only on the capacity of, and the advantages afforded to, an eloquent speaker, but who require temples for worship and praise and for the performance of various ceremonies and rites, and as much so to-day as at any age of the Christian era. Hence, although the writer gives very excellent suggestions for an auditorium, a lecture or concert hall, suited even to "social reunions and private theatricals,"—no doubt the most convenient forms for a large class of Protestant worshippers,—he has hardly covered the whole ground of "Modern Church Buildings."

J. B.

ADVERTISING ARCHITECTS.

To the Editor of the American Architect:—

Sir,— It is undoubtedly true, that the commercial and enterprising spirit of this country tends to promote advertising in a greater degree than in any other land; and that perhaps there is good precedent and no real objection to an architect publishing his business location in a line or two of newspaper type,—simply as "John Jones, Architect, 44 Robinson's Building." But what is to be said of such advertising as we have seen in a daily paper, where we are told that somebody's successor is now prepared to execute as fine work as ever, in architecture, and reminded that the designs made by the firm in the past, having been noticed frequently and favorably by all who have been associated with them, is a sufficient guaranty of somebody's abilities as a first-class designer? In like manner we are notified that particular attention will be paid to furniture and interior decorations, which are now got up in the most elegant and tasty style, that prices are, as they always have been, very reasonable, and all who intrust their work will be fully repaid by so doing. Surely it is only one step further to "a prize with every roll of plans." We note the reasonableness of the charges and the "tasty" style of the work. These, combined with the first-class nature of the gentleman's abilities, go to make up a picture which must, one would think, take well with those thrifty parties who go in for economy at any price. Yours, etc. D. I. Viders.

NOTES OF EXPERIENCE AND INEXPERIENCE.

Basin Overflows.— We see on looking back to Mr. Bugbee's communication that we were wrong. We took him to propose to run both waste-pipe and overflow out of doors, whereas he proposes to do this with the overflow alone. This, as he rightly argues, could do no harm, unless the pipe were so placed as to disfigure the house, for though the overflow is a necessary precaution, the discharge through it practically amounts to nothing. If preferred, all the overflows could be led together to any point where an occasional chance discharge would do no harm, and disconnected from the drainage. Mr. Bugbee says: "The meaning of my communication concerning the discharge of overflows from bath-tubs and wash-bowls was misconceived in your comments, in which you speak of the influence of climate. I propose simply an open pipe, no trap. It can't freeze up. It might let in cold air; but very little through an inch and a half pipe, and if the plug is put into the waste we need not trouble ourselves for a wonderful trap; any water seal would do." Eds

9. Old Materials.— There is no doubt that the materials always belong to the owner of the building from which they come; but it is customary to stipulate expressly that allowance shall be made by a contractor for any that are used in new work. But if a specification required him to work up old materials without requiring any allowance from him for it, he might very likely escape paying for it. The only safe way is to stipulate that the owner shall be credited with whatever is used in this way. Pl.

9. Old Materials.— The custom in Cincinnati is for the owner to tear down the old building clean, and neatly pile up the same, and the contractor to state in his proposition his allowance per M. for brick so furnished, and per perch for stone, and per thousand feet for lumber. Sometimes the contractor "lumps" the entire old materials, but the former custom is considered the best on account of its greater accuracy. A clause in the specifications would cover either way. C. C.

11. Wind Pressure.— On page 216 of the fourth volume of the *American Architect* Mr. John Dixon, C. E., says: "Twenty-eight pounds of pressure per square foot of surface would send a man flying through the air; it would sweep from the rails any (English) passenger train. Seventeen pounds pressure would level the Charing Cross Station." Probably Mr. Dixon is right, and as we do have, now and then, a train blown from the rails, or a large building blown inside out, I would like to know what pressures correspond to different velocities of wind. It is no uncommon thing to have the signal-service officers report the velocity of the wind at thirty or forty miles per hour. Indeed, the wind-gauge at Mt. Washington, N. H., registered only a month ago a velocity of one hundred and four miles per hour. What was the force exerted by it per square foot?

Wind-Gauge.

12. Trade Discounts.— Would it not be well if some trade-journal should publish discount sheets of the various kinds of building goods? The *Metal Worker* did so at one time, but for some reason has discontinued them. For architects, who are responsible for the correctness of the prices to which they certify, it is an immense annoyance to have nothing for certifying bills but the printed price-lists,—which without the discount sheets are of no more use than so much waste paper,—and to be obliged to form their opinions either *a priori* or from general recollection as to the correct prices. Take cast-iron goods for instance; how can an architect with a bill before him, and a printed price-list, be expected to know whether the discount on a particular article is 50 or 70 per cent? Sharp plumbers often send in bills for approval with all the materials charged at the list price, hoping that the architect will be too innocent to know that the discount on iron pipe is 70 per cent, and on brass work about 50, and they are too generally successful in this fraud. It is time, in the interests both of honest architects and of the public, that the whole system of concealed discounts and commissions was cleared up, and that those to whose care is confided the expenditure of large sums of other people's money should have better means of knowing the value of what they buy. Treasurer.

13. Waring's Check-Valve.— Can any impartial person say whether the Waring check-valve works well under sinks; say, as well as a ventilated S-trap in respect to clogging? The form seems likely to render it subject to catch lint and sediment in such positions. Anxious Architect.

NOTES AND CLIPPINGS.

Colored Glass Pictures.— The ancients had a most singular art of forming pictures with colored glass. It consisted in laying together fibres of glass of various colors, fitted to each other with the utmost exactness, so that the section across the fibres represented the objects to be painted, and then cementing them by fusion into a homogeneous mass. In the specimens of this art which were discovered about the middle of the last century, the painting has on both sides a granular appearance, and seems to have been formed in the manner of mosaic work; but the pieces are so accurately united that not even by means of a powerful magnifying glass can the junctures be discovered. One plate, described by Winklemann, exhibits a duck of various colors, the outlines of which are well decided and sharp, the colors pure and vivid; and a brilliant effect has been obtained by the artist's having employed in some parts an opaque, in others a transparent glass. The picture appears to be continued throughout the whole thickness of the specimen, as the reverse corresponds in the minutest points to the face; so that were the glass to be cut transversely, the same picture of the duck would be found exhibited on every section. It is conjectured that this curious process was the first attempt of the ancients to preserve the colors by fusing them into the internal parts of the glass, which was, however, but partially done, as the surfaces have not been preserved from the action of the atmosphere. [It should be added that these glass pictures are all small, usually being not larger than the ordinary Roman mosaics. — Eds.] — *Exchange.*

The Letting of Contracts in Ohio.— A bill is now before the Ohio Legislature which will, if passed, nullify the only good thing contractors now possess upon the statute books of that State. The good law referred to is one which necessitates the letting of all contracts in their separate departments. The amendment to this law makes it optional with County Commissioners, Boards of Education, and what not to receive proposals either for separate departments or for the entire work, as they may see fit, or it can be construed to mean that they (the Boards and what nots) shall receive both ways. The "rings," wire-pulling, and intrigues that would result upon this mode of the letting of public work would be a disgrace to any State having any desire for fair dealings.

A Trojan Dagger.— A dagger believed to be made of meteoric steel, exhumed by Dr. Schliemann in the royal palace of Troy, has been deposited by him in the British Museum. It is the first iron discovered by Dr. Schliemann in his explorations.

A Bruce and Wallace Monument.— Twenty-six years ago the sum of one thousand pounds was left in trust to accumulate, principal and interest, for twenty-five years, at the end of which time the whole amount was to be expended in creating a memorial at Edinburgh to William Wallace and Edward Bruce. It is not stated how large a sum is now at the disposal of the town council, but even at the low rate of interest which is customary in Scotland, there must be enough money to erect a memorial which will not shame the beautiful city, nor discredit with posterity the stalwart and upright characters of the men who are to be commemorated. It is suggested that the memorial shall take the form of two colossal bronze statues surmounting a fountain in the middle of an ornamental piece of water in the North Loch.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, MARCH 22, 1879.

CONTENTS.

THE committee appointed by the legislature of Connecticut to investigate the trouble in the piers of the new capitol, at Hartford, has finished its hearings; but we have not yet heard of its report. We will not attempt to anticipate its decision as to whose is the responsibility for the failure of the piers. One fact, however, seems to be made evident, and inasmuch as it contains an important lesson, of which building commissions stand much in need, we hope it will be distinctly proclaimed. This fact is that nobody who gave his attention to the work was competent to supervise the construction, or to judge of it. General Franklin, who is spoken of as superintendent, appears to have acted only as a consulting engineer, and not to have watched the work closely. Mr. Brown, the actual superintendent, as we have said, is dead, and cannot defend himself against the attacks of the witnesses whom the contractor has brought against his memory. But it is not disputed that he accepted the slack-bedded stones which the contractor furnished, nor that when the first courses were laid in cement mortar with quarter-inch joints, he had them taken down and ordered the work reset with eighth-inch joints in a mortar or paste composed mainly of lime. Mr. Batterson, the contractor, claims to have protested against the thin joints, and shields himself under the assumption that he had no responsibility but to do as he was told. But we may assume, although he seems to have been very lax in his notions of stone-work, that he would not have wilfully built his piers so that they would not stand; and since he did not take care that the voids between the stones were filled even with the paste of lime, which, as he says, Mr. Brown insisted upon using, we are pretty safe in believing that he did not any more than his superintendent know what he was doing, or what was the relation of his piers to their work. We have seen no indication that any computations of the strength of the piers were made by anybody concerned in their execution, until they had shown themselves weak. It is not one of the things to which the ordinary builder and superintendent are habituated, to set a dome two hundred and fifty feet high on a series of piers, and therefore it is extremely foolish to intrust the management of such a piece of construction to the ordinary superintendent and builder, least of all when there is a question of setting aside any of the precautions which the architect has prescribed for making his work secure. On the whole, the performance wears a look of incompetence, and neglect or inconsiderateness, that is far from creditable. It seems to be pretty well made out, however, that Mr. Batterson did protest against the change in the setting of the stone, and if he does not seem to have had much idea of the limit of safety in his construction, it was at least not his business to know this, but the business of those who directed the changes.

As for the question of casing the piers in granite instead of making them entirely of granite, there is no doubt that it would have been safe if the work had been done in the best manner, and it might do, but for one fact, to say, as General Franklin said to the legislative committee, that the defective piers are stronger to-day than if they were all of stone-work, cut and laid like their facing. The difficulty was to be sure of the workmanship, and in view of the great likelihood of unequal settlement and strain in piers of mixed material, it was a hazardous thing to order the change unless those who ordered it were prepared to take extraordinary precautions to see that thoroughly good work was done. What was the actual quality of the workmanship can easily be judged if we may accept the testimony of the editor of the Hartford *Sunday Globe*, who says that he ran a knotted cane its full length into one of the interstices revealed by a drill-hole, and worked it about freely, and that he sounded another to a depth of fifty-six inches by actual measurement; also that three hundred pounds of type metal had been injected into single cavities. A curious fact which has been stated is that the superintendent, after having insisted on his own way in the lowest and most heavily weighted piers, repented of his error, and allowed the second range to be set in cement, and with wide joints as was first proposed, a concession which is justified by the result that these piers have not suffered at all. There is further testimony to the danger of trusting to brick cores in the fact which appears, that the cores have settled so as to leave, in some piers at least, a space of half an inch between the top of the brickwork and the granite binders that cover it. We must take issue with General Franklin, when he says that the fact that the brick imposts, which are of about the same section as the piers, have not yielded, shows that it would have been safe to build the whole piers of brick. We could not count him a wise constructor who would give a contractor brick piers to build and let him load them with three hundred pounds to the square inch.

THE city council of St. Paul, Minn., having occasion to build a new market-house, and apparently distrusting its ability to reach a satisfactory result by the usual process of inviting a competition of designs, has hit upon the device of inviting a competition of bids for furnishing plans, specifications, and superintendence for the building, thus thriftily availing itself of a certain laxity of professional discipline and practice which seems to prevail in that neighborhood, and at the same time avoiding the vexatious delays and annoyances attending the older and more complicated method. So long as such an appeal to the professional talent of the place is not likely to be made in vain, the city officials would seem to have some justification in making it, for, although they may be quite unable to decide properly as to the relative merits of competitive designs, no one can doubt their ability to reach a prompt, correct, and unanimous decision in a case of competitive prices. They accordingly addressed their propositions to two architects, Mr. E. P. Bassford and Mr. A. M. Radcliff, and in reply the former agreed to do the work for three per cent on the cost, and the latter for two and one half per cent. Mr. Radcliff was accordingly appointed architect of the new market-house. The high tone of professional practice which renders such a competition as this possible may be inferred from the fact that Mr. Bassford in a card has charged his competitor with a breach of trust, having agreed with him on a price of three per cent, while Mr. Radcliff rejoins that their agreement was on four per cent and not three per cent, "but," he adds, "knowing from past experience Mr. Bassford's custom in competing for plans with myself, I put my bid for two and one half per cent. The result shows by his bid how well he kept his word," — and, we may add, how well Mr. Radcliff kept his. It is not within the province of the American Institute of Architects to establish missions, but we might hope that the trustees would find it practicable to circulate some wholesome tracts in this neighborhood with a view to the placing of professional practice there upon a sounder footing.

Two new building accidents have occurred since our last record, which are good as examples. The floor of a hall in North Berwick, Maine, gave way during a town meeting, and dropped a hundred and fifty persons, it is said, down fourteen feet into a carriage shop below. A great many were injured, several of them being expected to die. The hall was thirty-five feet wide, and a twelve-feet section of the floor fell; so that if we believe the story that a hundred and fifty persons were huddled, together with the polling-desk, into a space of four hundred and twenty square feet, we have still a weight of only about fifty pounds to the foot to break down the floor of a public hall in a building which was almost new. One does not expect to find building inspectors in a country town, or that country carpenters will have any very exact knowledge of the strength of materials; and we may presume that the standard of building

and the dangers of public halls are very much the same in other country towns as in North Berwick. But there are building inspectors in New York, and they had examined and allowed the gallery which fell last week in Gilmore's Garden while the interminable walking-match was going on. It had been built or extended only a year ago, — when the lessons of many late disasters from faulty construction were fresh in the minds of those who were willing to profit by them, and ought to have been a stimulus to inspectors. It was thought strong enough for the people who gathered to see the match, because it had borne the test of the Arion ball not long before, the popular theory being that because a structure has borne a strain once, it will bear it again. But perhaps if it had not been for the Arion ball the gallery might have survived the walking-match, and then have fallen on the next occasion. A curious danger, which fortunately is a rare one, showed itself in this case. The crowd without, hearing by the noise that there was trouble inside, made a rush for the doors in a desperate attempt to get in, which was prevented by the police. If there had been real danger within, and a need to escape, the result would have been most disastrous.

We are glad to see that the elevated railway projects do not advance much. The committee of the Massachusetts legislature, to which were referred the petitions of the various horse railroad companies, for leave to establish such railways in Boston, have rendered so judicious and decisive a report against them that we trust they have made an end of schemes which were disapproved by most of the inhabitants of the city. There is hardly a town in the country to which elevated railways are less appropriate than to Boston. We may go one step further and say that there is hardly a city to which they are appropriate at all except New York, and possibly Brooklyn. The issue and maintaining of an injunction against them in Brooklyn does not seem to have discouraged their advocates there. We do not learn that the legislature of Pennsylvania has decided to allow the Pennsylvania Railroad to carry out their ruinous proposal to run an elevated track through Market Street, in Philadelphia, across the city, and around the new city building. It may be hoped that the example of the Massachusetts legislature will prevail. If these revolutionary means of transit are to be adopted elsewhere than in New York, it ought not to be until their working is better understood than it is yet; nor until the principles on which they are to be controlled have been determined. One of the most essential of these principles, it seems to us, is that they should be forbidden to take possession of any thoroughfare that is already occupied by traffic; but should be compelled to make their own highways, occupying the land they pass over, and paying for their right of way. Then there will be no question about their paying damages to those whose property they injure, and the willingness of their projectors to do this will be some test of the need for the roads, while the injury to the public will be reduced to a minimum.

We have received the first number of the published Proceedings of the Engineers' Club of Philadelphia. It is a handsome octavo pamphlet of eighty-six pages, illustrated with some neat cuts, and gives an impression of greater resources than are apt to be suggested by a first number. It contains a number of papers, concise rather than elaborate, which have been presented at the meetings of the club during the past year. They cover a variety of subjects of practical interest, among them two of direct value to architectural constructors, one on the Strength of Wrought Iron in Structures, and one on Bearing Piles, both of which give in small compass information which constructors ought to have at command, but are too apt not to have. There are also papers on the Oil Lands of Pennsylvania, the House and Street Drainage of the City of Philadelphia, the Scales of Maps, the Proposed Removal of Smith's Island, the Water Supply to a Stamp Mill, and an Empirical Formula for Strength of Wrought Iron Beams. Besides these, there are a number of short notes and communications on various engineering works at home and abroad, — among them an interesting note on the tunnels of the St. Gothard railway, in which we find it remarked with a rather amusing sincerity that "there is a tremendous water-power going to waste all over Switzerland." We wish Congress had paid more heed to the memorial here recorded in behalf of the continuance of the United States Board for Testing Iron, Steel, and other Metals, one of the most useful and satisfactory commissions which Congress was ever persuaded into establishing, but which it dropped, in spite of many urgent remonstrances, just when it had carried it far enough to reach the beginning of its greatest usefulness. A better result, we will hope, may attend the memorial to the Legislature of Pennsylvania in behalf of a geodetic survey of the State, which, we are told, is now pending. These Proceedings are published at the rooms of the Club, No. 10 N. Merrick Street, and their frequency, we are told, "will depend largely upon the encouragement received from persons whose business should lead them to give substantial aid toward the promotion of every interest of the club." This means, we suppose, upon the subscription list, which we trust will be large enough to warrant a frequent publication.

The *American Antiquarian*, of which the third number is before us, essays a function that it has become very desirable to have performed. The study of American archæology has become so large, there is such an accumulation of material, that there is need of some means of intercommunication among those who are busy with the subject, and of making known the results of their labors to the rest of the world. The *American Antiquarian*, if it fills this office successfully, will do good service. It is published in Cleveland, by Brooks, Schinkel & Co., and is edited by the Rev. Stephen D. Peet, Corresponding Secretary of the American Anthropological Institute, and of the State Archæological Association of Ohio. The leading article in this number, on Native American Architecture, is a good illustration of the difficulty of writing successfully upon even a remote and comparatively disconnected branch of a great subject without having a general familiarity with the whole. The subject of native American architecture greatly needs systematic study from persons who are versed in the history of architecture. Without the knowledge of this history a student cannot hope to discriminate between the significant facts and the insignificant, to make comparisons or draw inferences with security. A writer who was taught in archæology would hardly waste his time in quoting so second-rate an authority as Westropp's Hand-Book of Archæology; but what are we to say when one tells us that Mr. Westropp has divided the architecture of Italy into four styles, to wit: the Cyclopean, the Polygonal, the Irregular Horizontal, and the Regular Horizontal? Or what, when he lays it down, on the authority of Stephens, that "the true principles of the arch were not understood by the ancient Egyptians, Greeks, or Etruscans, or by the American builders"? Or again, when, trusting perhaps to his own inspiration, he says: "While, however, it requires a considerable degree of skill for the construction of a true arch, the capability of producing the curve or hemisphere would not necessarily imply any great degree of progression in the art of building"? The other articles are one by the editor on Traces of Bible Facts in the Traditions of all Nations, in which we are surprised to see Grimm's *Deutsche Mythologie* spoken of as his Dutch Mythology, an acute and lawyer-like discussion of the Inscribed Stone of Grave Creek Mound, an article on a Mythologic Text in the Klamath Language, and a short one on the Phonetic Elements in American Languages. To these are added several pages of correspondence on archæological matters at home, a variety of short notes on like topics with a wide range at home and abroad, and several book-notices.

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS, HELD AT NEW YORK, NOVEMBER 13, 1878.

MORNING SESSION.

The Convention was called to order by the President at 10 A. M. The first business was the delivery of the Annual Address.

The latter part of the Address, as originally written, consisted of a memorial paper on the late Mr. Upjohn, but this, by request of the Committee of Arrangements, was separated, to be read as a special paper on Thursday morning.

The Report of the Board of Trustees was then read by the Secretary, and laid on the table for future consideration.

Mr. Hatfield read the Treasurer's Report, which was accepted and referred to an auditing committee to be subsequently appointed by the Chair.

No report was received from the Committee on Education.

The Report of the Committee on Publication was read by Mr. Bloor.

The reports of Chapters were next called for. That of the New York Chapter was read by Mr. Bloor.

The report of the Philadelphia Chapter not having arrived, nor

that from Chicago, the Secretary read the reports of the Cincinnati and Baltimore Chapters, which were accepted and laid on the table.

MR. LONGFELLOW read the report of the Boston Chapter, which was accepted and laid on the table.

The report of the Rhode Island Chapter was read by MR. STONE, and accepted, and laid on the table for future discussion.

The Secretary for Foreign Correspondence, MR. LONGFELLOW, reported that the only duty he had been called upon to perform during the year was to give a note of introduction to Mr. Joseph T. Clarke, of Boston, whose expedition abroad was mentioned in the report of the Boston Chapter.

Before proceeding to the election of officers, which was, according to the rules, the next business, the convention, on the suggestion of the Committee of Arrangements, devoted a portion of its time to miscellaneous business.

MR. STONE wished that the question of the publication of the proceedings of the convention might be considered. He called attention to the remarks upon the subject in the report of the Board of Trustees, and in that of the Baltimore Chapter, and hoped that at least there might be printed a list of the members of the Institute.

THE SECRETARY referred to Mr. Bloor, the late Secretary, for information. Mr. Bloor said that he had tried in vain to get some member of the Institute to edit the proceedings, and after applying to several members personally, without success, and being prevented by ill health from undertaking the task himself, he had concluded that the publication was impracticable.

MR. POST asked whether there was not a Committee on Publication connected with the Institute, and learning that there was, he proposed a vote of censure upon that committee for not publishing the report. He thought that it was for them to see that the report was edited. If, as was suggested, there were no funds to pay for the publication, that was another matter, but if they had neglected to prepare the report, he considered that they had failed in their duty.

MR. HATFIELD said that no application had been made to the Treasurer for funds for publication. An expenditure of $300 or more shown in his report under that head was in payment for the previous publication, the bills for which did not come in until the present year.

At the request of Mr. Bloor, Mr. Post allowed his resolution to be laid upon the table until the next morning, in order that the Chairman of the Publication Committee might be present to make further explanations.

THE PRESIDENT next proposed the consideration of the resolutions of the Rhode Island Chapter in regard to the liability of architects, the discussion of which was appointed as part of the programme of the Convention. The Resolutions were read.

MR. POST objected to the resolutions that they implied that every building had a superintendent or designer, whereas the great majority of buildings in which failure had taken place had had no professional designer and no recognized superintendent. He thought the responsibility of the owner, where he neglected to employ competent persons in the design and supervision of his work, ought to be considered and incorporated in the resolutions; but he doubted the utility, at best, of such resolutions as those under consideration. In his opinion, the object of building laws would be better attained by simple rules prescribing the limits for spans and distances of floor beams, the weights of materials, and for protection of buildings from fire and similar precautions, than by the minute directions which now form the greater part of the Act. These directions had been made, so far as the New York Building Act was concerned, and to some extent with those of other States, with reference to the standard lot, twenty-five feet in width, and when attempts were made to build with different dimensions, there had been repeated instances of failure, where the Act had been complied with strictly. His own idea was, that instead of taking away all responsibility from the architect, by prescribing for him the dimensions of all his materials and his mode of construction, the law should recognize his authority, and, while allowing him liberty of design, should hold him strictly accountable for ignorance or incapacity. Next to the architect the builder should be held responsible for failures, and after him the owner, so that one of these, taking them in this order, should be made accountable for every structure erected.

THE PRESIDENT asked for papers on the subject. The programme announced the discussion to be on Commissions to Investigate the Causes of Failure in Buildings, and Penalties when the Result of Culpable Negligence, and if any papers had been prepared, it would be well to have them read at the beginning of the discussion.

MR. CLARK, of Boston, then read a paper on the Legal Responsibilities of Architects. (See *American Architect,* Nos. 154, 155.)

The discussion being resumed, MR. MASON, of Newport, R. I., explained that the Rhode Island Chapter had forwarded their resolutions some time previously, in the hope that they would be considered at the Convention, but, having heard nothing from them until a few days before the meeting of the Convention, they had supposed that nothing was to be done, and had not prepared themselves to aid much in the discussion.

THE SECRETARY stated that the matter came before the Board of Trustees, and the names of Mr. Post, Mr. Wight, Mr. McArthur, and Mr. Clark were suggested for invitations to prepare papers on the subject, and a request was sent to each to do so.

MR. CADY thought that the Rhode Island Chapter, having originated the resolutions, must be able to furnish some light on them.

MR. STONE said that the resolutions were brought up in the Chapter, and adopted after some little discussion, more for the purpose of bringing the subject before the profession, than to furnish an example of a well-considered proposition. He doubted whether he should himself favor the enactment of a law expressed precisely in the form of the resolutions, but that some kind of legal protection to the public was needed, he thought was evident. There was n standard or limitation whatever as to the amount of skill to be expected of those who put themselves forth as architects, and it seemed that a more strict legal accountability might be of use in sifting out the well-trained masters from the ignorant hangers-on of the profession.

MR. ROBERTSON thought it unnecessary for architects to go out of their way to promote the passage of a law for the protection of the public. It seemed to him that they were quite able to protect themselves.

MR. POST thought that in principle Mr. Robertson was quite right, but indirectly it would be of great advantage to architects to be kept more rigidly accountable for, and consequently to be less hampered in, their designs and modes of construction. At present, the minute provisions of the Building Act, made with reference to one kind of building, hampered and injuriously affected both construction and design in many cases, besides increasing expense by compelling the outlay of money on points where it was often entirely useless. If a movement, however initiated, could be made toward imposing more accountability upon architects, it would tend to relieve them from the burden of specific requirements which now took from them the responsibility for their constructions, and placed it upon the inspectors of the Department of Buildings.

MR. HATFIELD mentioned that some years ago a committee, either of the Institute or of the New York Chapter, had been appointed to examine the Building Act, and suggest improvements. They had spent some time in correcting the details spoken of by Mr. Post, and in making the law more general, and had visited Albany and held conferences with a legislative committee, and their plan was adopted by the committee, and the draft of the amendments printed, but by some political intrigue the whole of the printed edition disappeared, and the matter dropped, and they had not cared to attempt to revive it the following year.

MR. FERNBACH thought that the head of the building department ought to have extensive authority in carrying out the purposes of the law in special cases. One trouble was that the inspectors were often placed in office as a reward for political services, and did not by either training or experience command respect for their decisions. He thought it hardly necessary for architects to take pains to have laws passed for holding them to a knowledge of their business, and they might take warning from the fate of Mr. Hatfield's committee, that a legislature would be quite likely to transform their proposed law into something which they did not intend or desire. He thought the end would be best attained by efforts among themselves to raise the standard of professional attainment and skill, and to supply the means of education where lacking.

MR. LORING thought there would be an advantage in a more strict interpretation of the duty of architects, that incompetent persons would be less inclined to assume the name, and the public would be disposed to look more sharply into the character of those who were understood to be entrusted with such responsibilities. He had, with other members of the Chicago Chapter, worked long and earnestly to secure the passage of a complete building law, but their efforts to construct a law which should provide for all cases had only brought to them the conviction that such a thing was impossible, that at this day it was useless to try to supersede the personal skill and intelligence of the architect in providing for the new materials and novel applications of old materials, which were daily brought into service. He had been in Rhode Island when their present excellent law was passed, and was glad to say that under that law a person who called himself an architect and undertook the responsibilities of the profession could be held accountable for the manner in which he executed his constructions.

MR. ROBERTSON thought that the standard of professional practice could not be raised by piling on penalties for incompetence. If the profession had the means of saying to the young man seeking to enter, "You must prove yourself qualified up to a certain standard or you cannot come in," he thought the prospects of the advancement of the art would be much better than if the only thing they could say were, "If you design a building and it fails, you will be liable to a penalty." Deeply as all were interested in promoting the influence and standing of the profession, he could not see that anything was to be gained in that direction by legislative enactments.

MR. HATFIELD inquired whether the law did not now hold architects responsible in the same way as members of other professions were accountable for malpractice. The paper read by Mr. Clark seemed to show that such was the case. Besides, an architect was held to the exercise of proper skill by the certainty of loss of reputation in case of the failure of one of his structures. The only persons in the profession who were not so restrained were the peripatetic individuals who made their appearance on the scene when

an opportunity for employment offered, and again disappeared, to turn up in some other place; the "gypsy architects," as one of his correspondents called them. These had no reputation to lose, and might act accordingly, but the respectable practitioners had enough at stake to make them careful.

Mr. Stone thought that a law in accordance with the resolutions of the Rhode Island Chapter would tend to protect architects by defining the extent of their responsibility, and that where the owner and builder wilfully refused to follow the architect's directions, the penalty would be shown to belong to them to suffer.

Mr. Longfellow said that with the question of responsibility of architects and superintendents should be considered that of the limitations of superintendence. If the responsibility for choice of materials, for supervision of each workman, and inspection of every corner of the work were to be recognized as belonging to the architect, no portion of the weight being imposed on the builder, the commission for such service ought to be much larger than the present rule. If a client were to come to him and say, "I want you to put up this building, and I shall hold you responsible for any accident that may happen, for the quality of the workmanship and materials from beginning to end," he would reply, "I will not undertake it unless you will pay me, — not five per cent, but ten per cent." If the client should continue, "I want you to employ such and such workmen," or "I want you to award the contract to the lowest bidder, whoever he may be," he would say, "Then you must pay me still more." If the architect were to be held responsible he must have the selection as well as the control of the workmen, besides leisure to watch every part of the structure. If such supervision were needed, a discrimination should be established between that and the ordinary superintendence which was now understood to be required, and the extent of responsibility belonging to each kind should be determined.

Mr. Post said that there was no doubt that under the existing state of things, the architect was responsible for the excellence of his work without any resolutions of Chapters or Institute. It was only in the large cities that by the operation of building acts, which compelled him to submit his plans for approval to the department, and appointed inspectors to watch their execution, he was relieved from his legal responsibility for the excellence both of the construction and of the execution. This was why he took so much interest in the legislation proposed. He did not wish to see enactments to make architects responsible, but he did wish for such modification of the building acts as would add to both the responsibility and the liberty of the architect, by freeing him from the minute directions as to special matters by which he was now hampered, and allowing him to design, restricted only by general provisions, and by the consciousness that the law held him to the exercise of proper skill.

At this point, lunch being announced, the Convention adjourned, to meet again at 8 p. m.

NOTICE OF THE FIRST COMPETITION IN INTERIOR DECORATION.

The programme for this competition is the treatment of the wall of a private library in a city house. This wall must measure twenty feet in length and twelve feet in height; it is to be pierced by a door-way, and may be decorated either by a large painting or by a statue of the Venus of Milo, while bookcases occupy as much of the remaining space as may seem desirable.

Only eight designs have been received, and of these one, that of *Peveril*, arrived too late to be considered in the competition. Considering the standard established in preceding competitions, the present one is on the whole disappointing in its results, in regard not only to quantity, but quality also.

The contribution of *Greece* however, shows an excellent feeling for architectural proprieties; it is full of careful study, and free from affectations of design. An architect who begins with considerate performances like this has laid sound foundations upon which any desirable superstructure may be developed. The general proportions of the wall-surface are harmoniously established, and the composition has the fundamental merit of suggesting a complete apartment. The manner in which what may be called the constructional order of the room is taken up by the bookcases, without encumbering them with details too large for their uses, — the way in which its scale is adjusted, so as to make the transition from the heavy pilasters which flank the door-way and mark the corners of the room to the light coupled pilasters which divide the bays of the bookcases not too abrupt, is the most architectural feature of the design, and is well studied out. The decorative picture over the door-way is well bestowed. The busts on either side of the door, however, are placed too low; they should be on a level with the eye. The combination suggested of mahogany with black walnut would be difficult to manage with success as regards not only color, but the unity of the design, which is so well established in line that any variation in color would be apt to subdivide it and separate the constituent parts too much. The composition does not suggest or require any play of color. A light wood of fine grain would be most effective. The idea of treating the upper part of the wall-surface over the bookcases with an "arabesque in natural colors upon a gold ground" is out of scale as regards detail, being quite too small, and on the whole entirely unnecessary.

The following out of the design, however, is not up to the merit of its conception and management. Such profusion of ornamental detail is uncalled for here, and always gives an air of pretentiousness which it is difficult to redeem from vulgarity. It can be justified only in rare cases, and by such refinement and skill as can make the ornament strikingly beautiful in itself. This is not the case here. The mouldings and ornaments are ordinary, and the fact that they lack refinement is emphasized by their exuberance. There is also a curious lapse from the sense of propriety which marks the general handling of the design, in the way in which the shafts that are the leading features in the lower section of the cases are carried up into console-buttresses, which strike between the coupled pilasters above, and bear only against the books themselves.

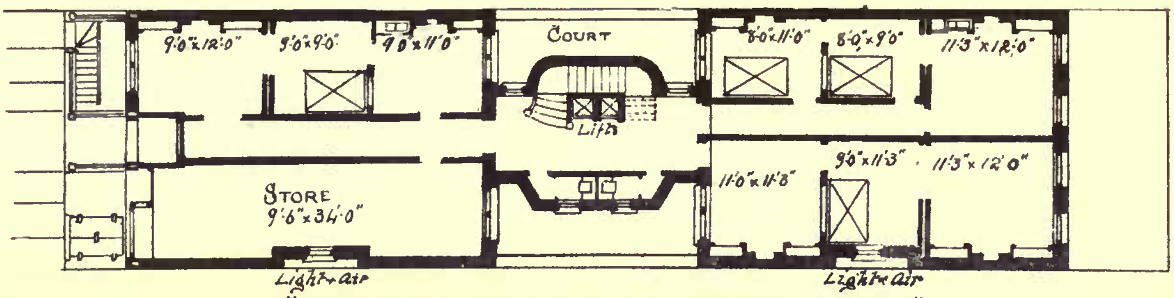
The drawing signed *Saint Austell* has good points of general effect but sadly needs study in detail. The author is capable of composing good detail, as is shown in his large scale marginal sketches, but he has not disposed it effectively upon his design, which seems to depend too much upon a certain smartness of execution with the drawing pen. As a composition of architecture it is meagre and misleading. The wood panels over the bookcases could never be seen; the frontispiece over the door is badly mixed up with the cornice of the room; the cornice itself is weak and insufficient; the bookcases are wanting in detail, the shelves are too long; the curtains covering the books are far too massive for such use; the niche in which the statue is bestowed is not well managed. A little more thought on this design would have rescued it; for it has good elements, besides a general expression of sobriety and of refinement in detail which are much to be commended.

Peveril gives us a vigorous drawing with some commendable free-hand work. The architectural lines and motive are good; the window recess is cleverly conceived; the wall-space, though divided too equally horizontally, is good in vertical proportions, and the general intention of the design is capable of development into a successful composition; the introduction of the statue is managed with cleverness and decision; but the detail is hasty and careless. The cornice of the room is not vigorous enough for companionship with the rest of the detail; the door-way, with the arch and tympanum over, sadly needs study, and has not been considered in perspective; the different planes of the door and the tympanum would give trouble to reconcile; the pilasters with their projecting caps and bases should not be returned against the books, and the dado is very badly designed. The beam or arch, separating the window recess from the rest of the room, has evidently never been studied in elevation, and the window seat is too high and too narrow by far. The disposition of books upon the top of the dado shows an impracticable depth of shelf.

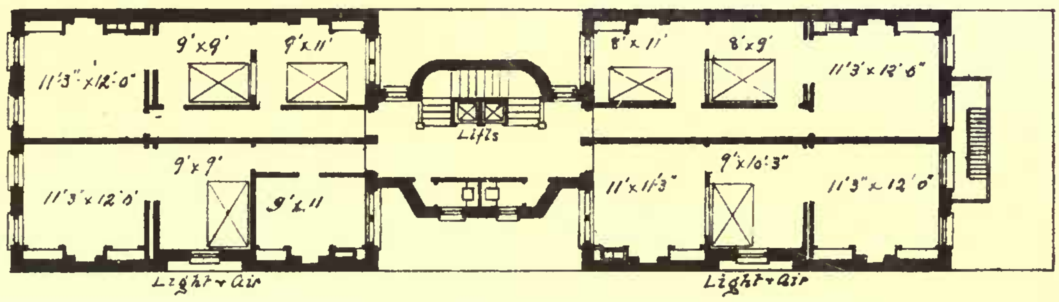
Homer does not attempt to give an academical design, but frankly presents an ordinary domestic wall with panelled dado, papered screen and cornice above, which by the bye is not explained by any section. The only composition is in the door-way and in a movable bookcase, both of which have far too much wood-work above them. The latter in fact is a cabinet and not a bookcase; but even as a cabinet, it is clumsy in its proportions and overloaded with meaningless and ineffective ornament, especially in its upper part. A certain amount of caprice is admissible in a piece of furniture like this, but the caprice should be graceful and duly subordinate to the uses of the thing which it undertakes to adorn. The detail of this part of the work has evidently been conscientiously studied; but it is made up of too many constituent parts, and these parts do not harmonize together; the styles are too wide for elegance of effect, and the central division of the crowning mass is incongruous in line with the others. The author, if he will study the designs of the cabinets of the sixteenth century, will see that, in the best work, the outlines are nearly always sober and architectural, and that the play of imagination is confined for the most part within the conventional limits of panels. But, as we have said, this is not a bookcase at all. The primary requisite of a bookcase is that the books should be visible and accessible. If glazed doors are used, the styles should be as narrow as is consistent with strength, and if divided into small lights, the divisions should be contrived so as to interfere as little as possible with the inspection of the books. The door-way is overloaded with wood-work, is too heavy, especially in its lower parts, and betrays a straining for originality which is not a wholesome characteristic in young designers.

En avant, on the other hand, is far too architectural, and presents a full massive Doric order better suited for exterior than for interior use, and the bookcase in the inter-columniation is encumbered with too much wood-work, in order, we suppose, to keep it in harmony with the great columns and entablature. The cornice of the bookcase, if correctly drawn, would make sad work in adjusting itself to the round fluted surface of the shafts. The manner of placing the statue is more ingenious than appropriate. The scale of the design is so large that the details must necessarily be far too coarse and heavy for a library in a private house. *En avant* has, however, made an honest error. He has used his order without any affectation of originality. Let him try the experiment of attenuating the detail of the order he has chosen without necessarily losing the sentiment of it; let him abandon the round columns and make his detail more delicate. He is much more apt to reach safe results from such a starting-point, than by committing himself to unknown seas of caprice without the rudder of experience and the compass of knowledge to guide him.

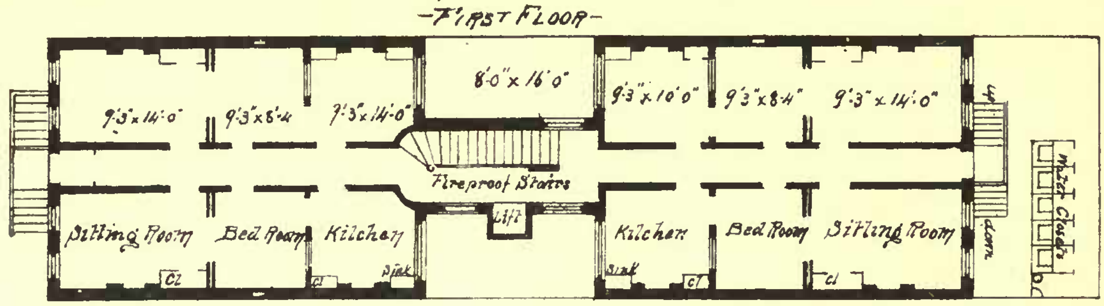
Renai is rather more in scale than his predecessor, but in rendering is hard and meagre. His composition is modest and temperate,



"LIGHT AIR AND HEALTH C."

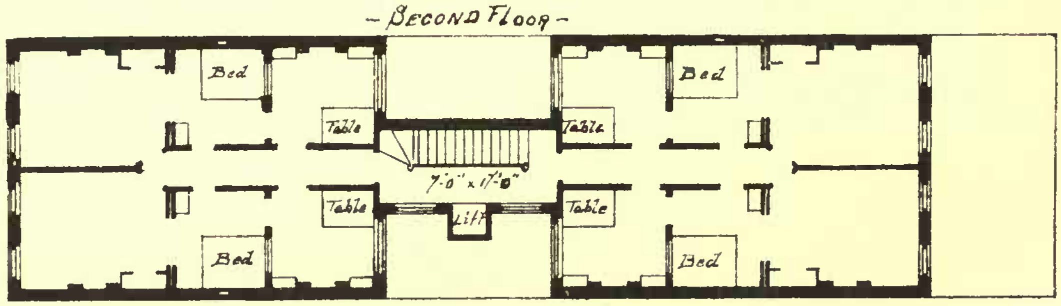


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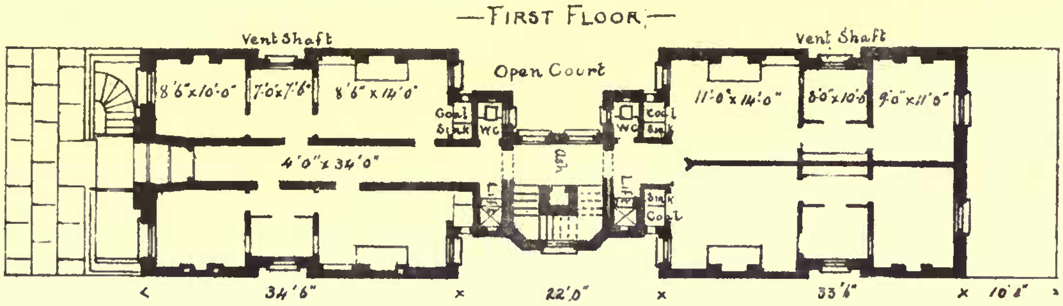


"KENSINGTON."

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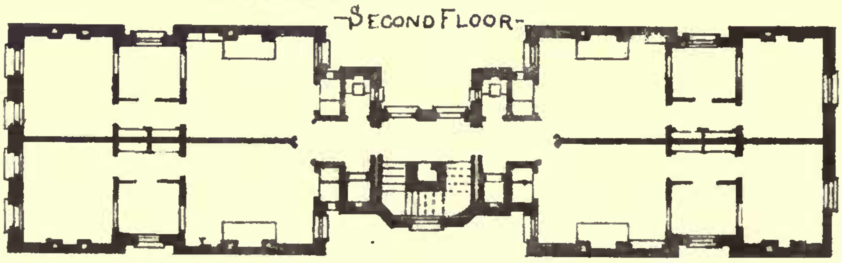


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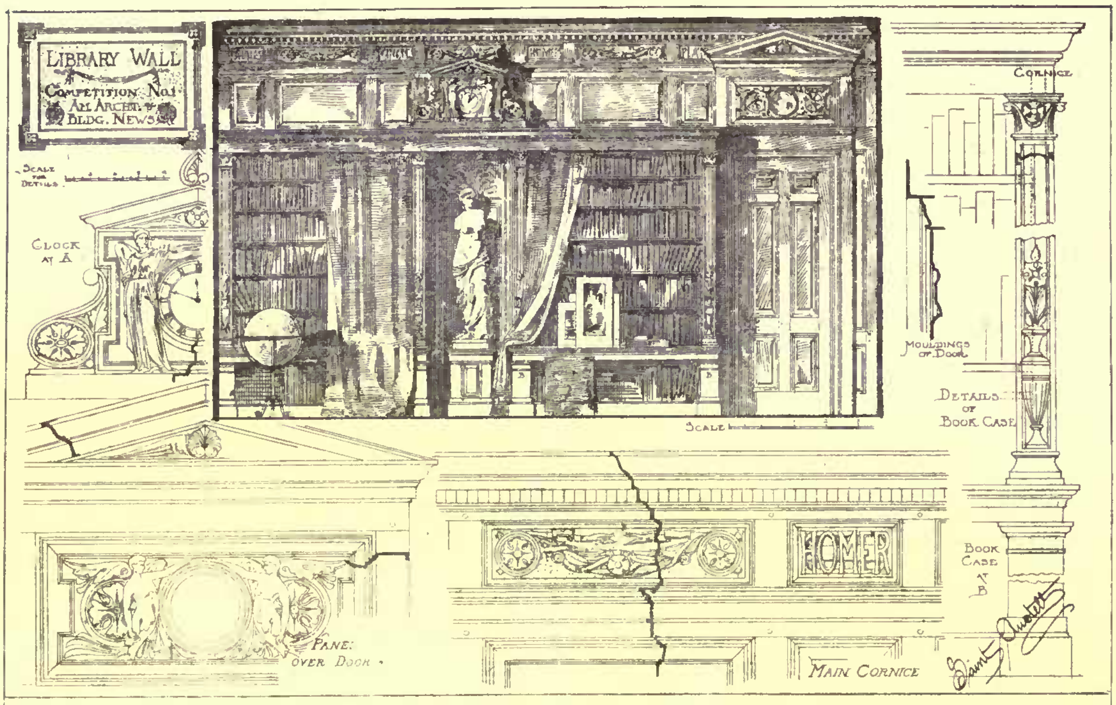
"PETER COOPER."

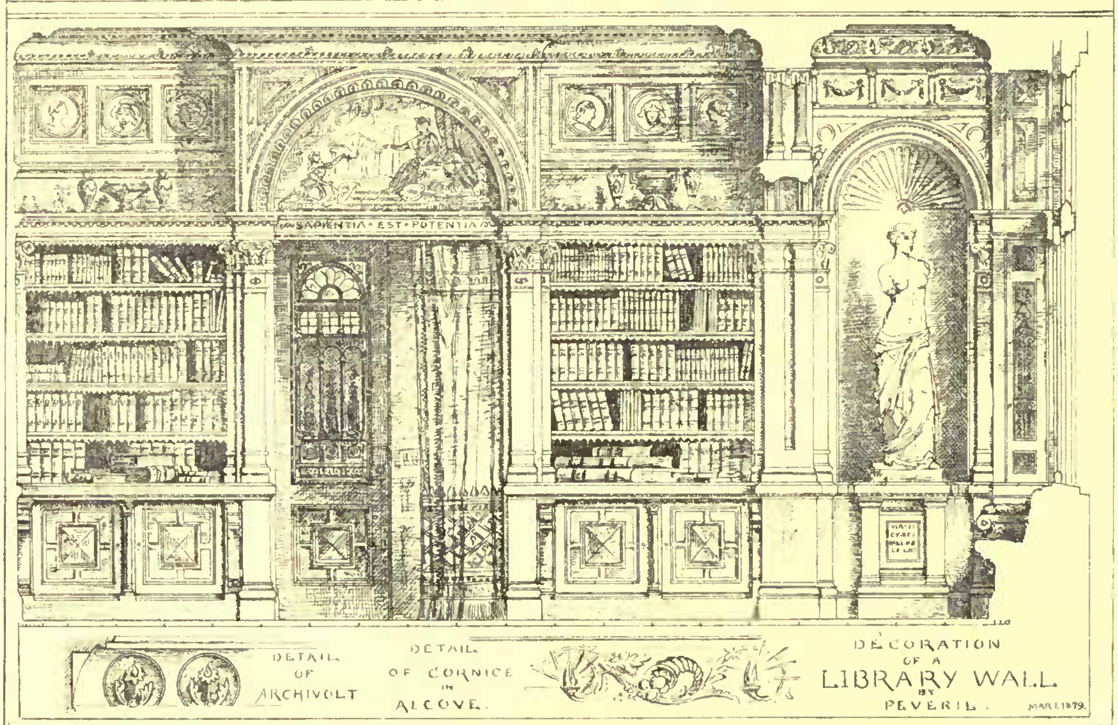
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THE "PLUMBER'S" PRIZE DESIGNS FOR A TENEMENT-HOUSE.



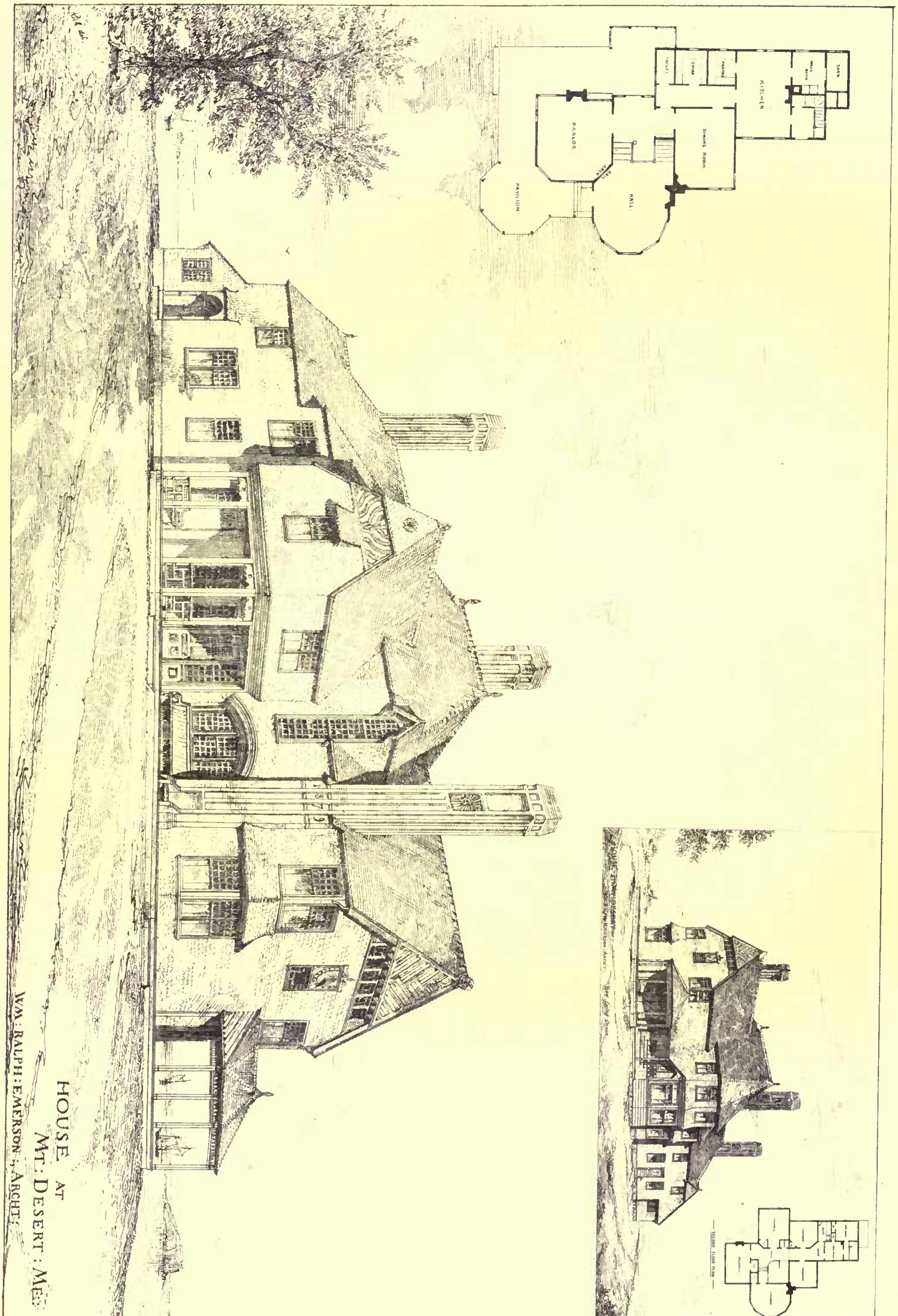




The Heliotype Printing Co. 220 Devonshire St Boston

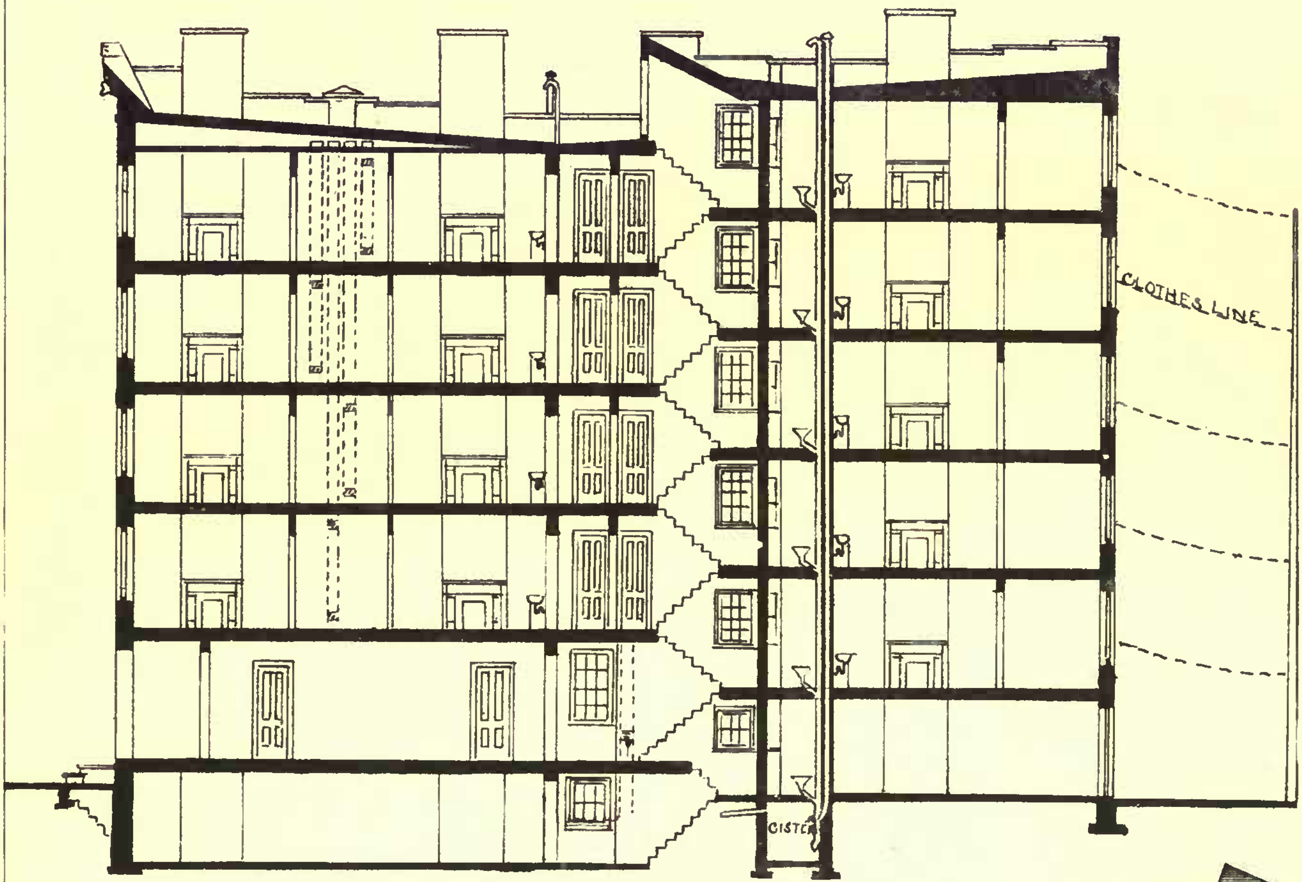
Interior Decoration Competition No 1.

A Library Wall.

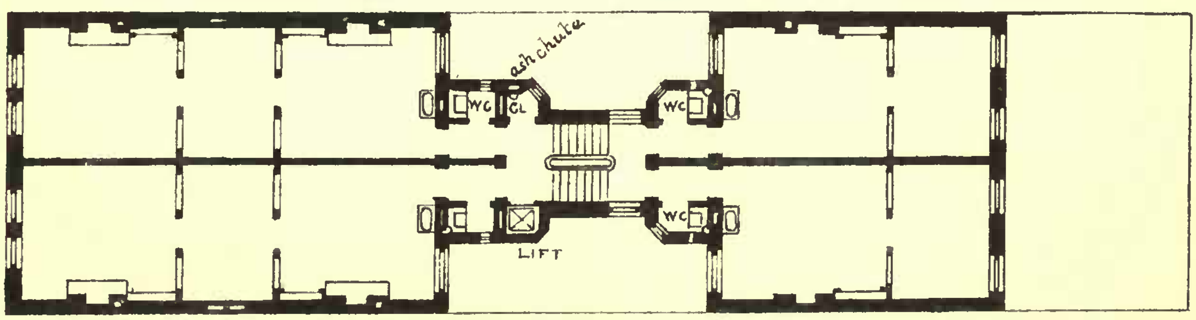


HOUSE AT MT: DESERT: ME:
WM: RALPH: EMERSON: ARCHT:

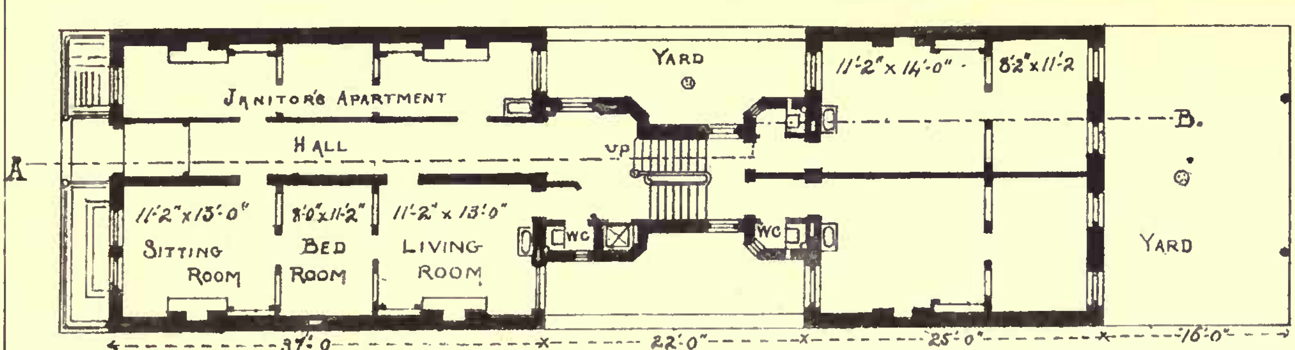
THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON



Secton AB.



Second Story.



First Story.

The Heliotype Printing Co. 220 Devonshire St Boston

The "Plumber's" Prize Designs for a Tenement-House.

and if rendered with less insistance of reticulation in the backgrounds and explained by shadows properly thrown so as to define his recesses and projections, he would have done himself greater justice. The entablature of the room is too heavy for the pilasters, and the cornice of the bookcase is overwhelming in weight and very bald in design. The pedestal of the statue is made up of too many parts; it is confused and disproportioned to the height of the figure. The composition is not honestly thought out. Not more than half enough time has been spent upon it, and the work has been done with a heavy hand.

Haddon seems to have bestowed a good deal of invention on his design and not a little care in presenting it. The main lines of his composition are good; the motive of the wall treatment and its connection with the ceiling are fairly managed and exhibit a proper unity of treatment. The ceiling suggests a rich effect. But the wall above the impost line becomes very much confused in the composition and is far too pretentious. It was not a happy thought to stand the pilasters upon diminishing pedestals. The main defect of the design, however, is that the bookcases, although symmetrically arranged, are purely accidental in their relation to the architecture of the room. The room in fact would be better without them; they are not made an essential part of the design. If the line of the cornice of the bookcases had been raised ten or twelve inches and made continuous around the room, and if the pilasters had been brought to the front of the bookcases, leaving a deep recessed frieze without the arches, which are too light for the style, and too near the ceiling, the design would have presented elements better adapted to the production of an architectural effect. The details are thin and meagre and not understood by the designer. The rendering of the drawing is wanting in decision and force. *Haddon* should work on a larger scale and study his namesake more intelligently, if he must needs affect this style of the English mansion of the period, which is not a good model for a beginner. It would be far better to remain loyal to the suggestions of the orders than to be deliberately and consciously ungrammatical in respect to them, as this designer is.

Kp. gives us a bookcase set in a recess under an oval arch, between a door on one side and a mirror on the other, all treated somewhat in the manner of the eighteenth century. The main defect of the design is in its proportional divisions, there being an absolute similarity of height in the wainscot and the portion of wall-surface above the impost, and in the corresponding features of the bookcase. The importance of contrast in such proportions has often been insisted upon in these notices. The cornice is very much too small and the bookcase is not a bookcase, but a cabinet, and is too much encumbered with wood-work; the styles are too wide; and it is an affectation in this and several other designs to cut up the glass into such small lights. The nearly equilateral pediment which forms a conspicuous feature in this design is not well introduced, and is in itself of ugly proportion.

THE ILLUSTRATIONS.

PRIZE DESIGNS FOR A TENEMENT-HOUSE.

WE reproduce this week the plans, and in the case of the design of Messrs. D. & J. Jardine the section, because of the peculiarity of its stairs, of the four designs to which were awarded the prizes in the competition instituted by the *Plumber and Sanitary Engineer.* The first prize, $250, was awarded to Mr. James E. Ware, author of the design marked "Light, Air, and Health, C;" the second prize, $125, was awarded to Mr. Henry Palmer, whose *nom de plume* was "Kensington;" the third prize, $75, was carried off by the design signed "*Ut Prosim*," by Messrs. D. & J. Jardine; while the fourth prize, $50, was gained by Mr. William Kubles with the design signed "Peter Cooper."

DESIGNS FOR A LIBRARY WALL. COMPETITION NO. 1.

Of the eight drawings submitted, one of which was received too late to compete, the committee has decided to award second prizes to the authors of the designs signed "St. Austell," and "Greece." The criticism of the designs submitted may be found in another column.

HOUSE AT MT. DESERT, ME. MR. W. R. EMERSON, ARCHITECT, BOSTON.

This house is to be built during the coming summer for a Boston gentleman. A feature of the plan is that the part of the hall facing the ocean is raised four steps above the entrance hall, and the dining-room is reached through a low arch under the staircase. The estimated cost is $7,000.

A CORRECTION.

We are advised that we made a mistake in attributing to Mr. W. H. Lynn the authorship of the design of Kent Gate, Quebec, published in the *American Architect* for March 8, whereas Mr. Thomas S. Scott, chief architect to the Dominion Government, is the architect.

RECENT PICTURES IN NEW YORK.

THE twelfth annual exhibition of the American Water Color Society, which has just closed its doors, showed a certain advance upon any previous collection. The advance was, however, in the average quality of the work. Few individual drawings could be cited as of great actual or prophetic interest. The pictures filled the Academy of Design with the exception of the large south room, the catalogue giving about six hundred numbers. Foreign works were few. A dash by Fortuny bore the most noted name, — two hasty little figures rated at $1,000! Simoni's Jester showed that in pure aquarelle, without any use of body color, the utmost finish can be attained, the utmost expressiveness conquered. The manipulation was as careful, the detail as well rendered, and the tints as thoroughly blended as in oils. Yet even on this small scale there was no loss of breadth or power, no finikin prettiness such as we saw, for instance, in a tiny Meyer von Bremen near by. Pranishnikoff gave us good snow effects with careful and spirited drawing. But with him the great elaboration produces a metallic hardness of effect. There was a not very remarkable Détaille to be noted, and a clever Moorish scene by Miranda. But here was the end of well-known names. Some drawings, however, signed with less familiar signatures were evidently of continental origin. Though not remakable among their kind, they were interesting for comparison of method. Among such were a landscape by Harpignies, some architectural subjects by Julius Schledorn, and a view in Normandy by Marny. These gave proof that by deeply marked lines and contours done with the point of the brush a better effect is often produced than by the insipid smoothness of tint we are apt to prefer, or by the lavish use of opaque color. A clever little Italian scene by Frantz, full of dash and style, had a merit often lacking to more ambitious drawings. One saw at a glance its *raison d'être* as a picture, why that subject was chosen more than another.

Speaking of method, it was curious to see how apt the same hand was to try many ways with very little resultant variety in the quality of work produced. In Mr. Charles Parsons's clever studies from the New Jersey coast we saw some done in pure aquarelle, some almost wholly in body color. Mr. Colman in his Kenneth Abbey used transparent tints alone. In his Market Day in Brittany, he supplemented them with much opaque paint, with no gain in relief or brilliancy. The picture was flat and without atmosphere.

Mr. LaFarge's name is apt to lead me speedily to his drawings. One of the Trinity Church cartoons, the Nicodemus, hung in the corridor, but scarcely calls for comment at this late date. In one picture he gave us some roses, beautifully done. Some of his worshippers assure us that in another, called Moonlight over Snow, we had a landscape most poetically conceived and rendered. For myself I have never seen Nature render herself in just that way, or in any way that could with fairness be so transcribed. Mr. LaFarge's other contributions were small and careful copies of Oriental pottery and inlaid work, — much labor thrown away. It is impossible to give their brilliancy of glaze and richness of tint on paper; and if it could be done, what were the use of the doing? Mr. LaFarge does not attempt to make a still picture of grouped and contrasted objects. He merely copies one such object for its own sake. The result is scarcely more valuable than an elaborate bit of illumination.[1]

Among the men whose work is well known and varies little from year to year, Mr. Nicoll was as pleasing as ever, especially in No. 11, a Late Autumn Twilight. Mr. Wood and Mr. Bellows gave us the essence of an older style of work, now fortunately falling into disuse. Mr. Winslow Homer exhibited no less than twenty-nine numbers, in which the various yet cognate eccentricities of his brush were fully represented. His scale of color varies exceedingly. In A Rainy Day it was soft and blended and more or less true to nature, though hardly to nature as she appears on a rainy day. It is inexplicable that this sort of work should be possible to Mr. Homer, and yet not be often affected by him. He turns in preference to most unbeautiful figures of wooden outline and glaring diversity of tint. The most painstaking attempt to discover his standpoint, to see nature as he saw her, and to enter into the spirit of his translation, utterly fails to explain much of Mr. Homer's work. Nothing was ever like his Chestnut Tree (No. 54) in life, and it surely is not desirable that anything should be in fancy. In No. 323 we had a sky of untouched white paper, with figures and grass in heavy dark tints; in No 356 a deep lavender heaven and scarlet cows dabbed in with the same brush that had been loaded for the autumn sumach-bushes. Mr. Homer must have some idea of the indistinct crudeness of his own work both in outline and in color, or he would not carefully label his pictures Girl; Sheep and Basket; Girl on a Garden Seat; Girl, Boat, and Boy; Girl with half a Rake; and so on.

Mr. Magrath is at his worst in large figures, such as his Milkmaid, at his best in his tiniest landscapes. These are pretty, but entirely conventional, as was shown, for instance, by two that hung side by side, and were labelled respectively Morning and Evening. The scale of color and the sentiment were identical in each, and it would have been hard to tell whether they were most like the morning or the evening, though so exactly like each other.

Among the file of younger artists, Mr. Shirlaw took, as usual, the first place, and easily, — and this although we had no important work from his hand. Indeed, the most ambitious, By the Wayside, was the least satisfactory. Mr. Satterlee has a strong desire for deep and brilliant color, with small power of managing it. His composition is good, but his drawing weak, and his pictures are more showy than beautiful. We miss the vigor and sure rapidity of workmanship which we are apt to seek in aquarelle figure painting. And we do not gain in exchange the masterly finish of such drawings as Simoni's Jester.

[1] The application of this rule, it seems to us, would suppress Jacquemart's etchings, and declare that no illuminetion had been worth the doing. — EDS. AM. ARCHITECT.

Mr. Tiffany was unusually disappointing this year. His street scenes grow more and more alike, whether called Tlemcen or New York or Geneva, though he is still best, perhaps, with Eastern subjects. His Fruit Market at Geneva is a mere bit of scene-painting. He wants, furthermore, the power to indicate that his models, — whether houses, trees, or what-not, exist on a larger scale in reality than in his pictures; even after reading that No. 315 was a Study of Melons, one could not help believing that they were olives. Mr. Carroll Beckwith's decorative studies, Clio and Thalia, to be supplemented, I believe, by the rest of the sisterhood, were most unclassic in sentiment. If it had not been for the "Κλειώ" so distinctly painted in in the background, one would have said a very earthly and unwise Parisian. The red-haired Thalia would be excellently in place as patroness of a modern variety-show.

Mr. Muhrmann's pictures are very clever, in spite of his scale of color being unfortunately sombre. If they err on the side of boldness, it cannot at least be said that he is a seeker after mere conventional finish and prettiness. Mr Frank Currier is certainly an "Impressionist" of the deepest dye. Close at hand, a smeared palette is as definite as his drawings. And the distance that brings distinctness out of ordinarily bold and broad work has no influence upon his. One must, in some cases, get, not only across the room, but on the other side of the stair-case, to perceive the intended effect. Sometimes it is of much interest and beauty, and always one is pleased to have found a meaning at last, as one is pleased to have conquered a Chinese puzzle. But, if pictures are for the pleasure of looking at them, Mr. Currier's are scarcely practical. For it is not often possible to command a vista of thirty feet in order to enjoy a drawing. It is a matter of ceaseless wonder how he calculates his effects when near enough to his block to paint upon it.

The flower and fruit pieces were unusually poor. In addition to Mr. LaFarge's roses, there were none of much value save one or two by T. Tuzo.

In the black and white room the cleverest things were two drawings by Mr. Jakobides, the property of the Art Students' League. Mr. Shirlaw was again a credit. Mr. Farrer's etchings are always good, and Mr. Reynolds's delicate little pen-and-ink portraits were charming. Most interesting, as usual, was the evidence of our proficiency in wood engraving. Often when drawings and cuts hung side by side, we saw how much of added beauty was due to the engraver, apt as we are to think an artist must necessarily have lost in translation.

The first annual exhibition of black and white under the auspices of the Salmagundi Sketch Club pretty well filled the Kurtz room, and was a good, if in no way a remarkable collection. Again the engraving was of the greatest interest. And once more I must note Mr. Shirlaw's masterly pencil, especially in some of the original sketches for his Sheep-Shearing. Miss Oakey still shows talent, though it does not seem to produce much that is valuable. An etched portrait of Whistler, by himself, bore witness to his cleverness in that line. And I must also cite a brilliant and characteristic etching of a Fortuny, by Robert Blum, as well as a bold pen-and-ink figure by Marchetti.

Among the private galleries offered for sale this winter, the Knœdler collection had the best known sponsor, yet it was somewhat disappointing. The pictures were by familiar sentimental artists, and were mostly good. But few were of the best their authors can do. And there was scarcely a canvas revealing the discovery of new talent. One name, however, unfamiliar to my ears at least, was attached to a picture of great beauty and even power, Poilpot's Gallo-Roman Sledge. There were some faults in drawing, or rather in the proportions of the subordinate figures, but the scale of color was as superb as Alma Tadema's, the drapery as good as his, and the strong humanity of the faces far ahead of him. The two principal figures were dramatically interesting and intense, besides being lovely. It was a picture that lived and breathed in spite of its archæology, and was beautiful to the eye as well. Landscapes from French and Dutch brushes were as satisfactory as usual, especially a Lambinet, a Collart, a van Wyngaerdt, and a Metzelaas.

In near prospect we have the exhibition of the Society of American Artists, heralded as a great advance upon its predecessors.

M. G. VAN RENSSELAER.

A PLEA FOR WREN'S CHURCHES.

THERE is something almost grotesque in our having at this time to protest against the wanton destruction of some of the noblest and most thoroughly national works of art that England has to show. The Turk who burns to lime the sculptures of Phidias or Praxiteles, or the "navvy" who with a stroke of his pickaxe smashes to pieces a priceless vase, may be excused on the ground of gross ignorance. They are utterly unconscious of the value of what they destroy. But the present age is, if anything, æsthetic. Art is the ruling craze. Unless a man would be set down as a mere Philistine, unfit to appear in the selecter circles, he must know, or pretend to know, something about æsthetics in one form or other, and be able to chatter about "tones" and "symphonies" and "arrangements," in the now fashionable gibberish by which, to the utter perplexity of those who fancied they understood their own tongue, the terms of one art are boldly, if not very intelligently, transferred to another. It is therefore somewhat remarkable that this should be the very time when, one by one, the works of one of the infinitesimally small list of architects of European reputation whom England has, till within our own memory, produced, — works all bearing the stamp of inventive genius, and thoroughly national in their character, — are being quietly swept away by the fiat of the Bishop of London and other ecclesiastical and parochial authorities. The prevailing taste of the time renders this wholesale destruction of Wren's churches the more surprising. For while, half or even a quarter of a century ago, our *cognoscenti* looked on these churches with pity and contempt as "pagan abominations," as not conforming to the Gothic style to which was then alone assigned the title of Christian architecture, now the tide has turned among our self-constituted teachers. The so-called "Queen Anne" mania looks fondly on all art-work of the Wren period, and that immediately succeeding, as something only "too precious," and our architects, having received their cue, leave off copying fourteenth and fifteenth century work, and fill their portfolios with tracings of the designs of Wren and Hawksmoor, Vanbrugh and Kent, and — so violent is the recoil — even the flat insipidities of the "Adelphi" Adams.

And yet, in the face of this classical revival, the best classical works that England has ever seen, the productions of that truly great and national genius of whom Mr. Fergusson justly says that, "though he did fail sometimes, it cannot be denied that he was a giant in architecture, whose greatest praise is that, though he showed the way and smoothed the path, none of his successors have surpassed, if indeed they have equalled, him in what he did," — the churches in which the originality of his genius shines most conspicuously, and in which he specially appears as an inventor, are being gradually demolished. That forest of spires and towers which excited good Sir Roger de Coverley's admiration as he was rowed from the Temple stairs to Spring Gardens is falling, and the "heathenish sight" which he viewed with so much sorrow to the west of Temple Bar is being extended to the city. From this point of view alone the loss of the churches is incalculable, for his steeples are the most signal proof of Wren's genius. None of his works more distinctly show his sense of proportion, his command of variety of outline and detail, his eye for the picturesque, than that group of campaniles which soar above the habitations around them, and, clustering like satellites round the majestic dome of the Cathedral, to whose swelling outline their taper spires form so striking a contrast, impart a picturesque grandeur to the general aspect of the city which it is hard to rival. Within our own memory at least ten of Wren's city churches, including some of his most original designs, have passed away; their materials have been sold to the highest bidder; their stones ground down for Portland cement; their rich carved oak-work, bearing the touch of Grinling Gibbons's magic chisel, gone to furnish new "Queen Anne" mansions; the remains of the dead carted off, and their monuments huddled away in alien churches, which, if the bold designs of our church-destructives take effect, will afford them only a temporary resting-place. In fact, by the disastrous "Union of Benefices Act," only four out of the fifty city churches are safe from destruction; and, unless some more decisive measures are taken than have yet been adopted to stay the rage for devastation, the noblest triumphs of Wren as a church architect will soon exist only on paper.

The first city church removed subsequently to the great fire of 1666 was St. Christopher le Stocks, with its pinnacled Gothic tower, which somehow managed to escape the conflagration, absorbed in 1781 by the Bank of England, which had already swallowed up the whole parish. Its preservation as a private chapel for the bank directors would then have been deemed a flagrant anachronism. But that would have been the right use to make of it. Half a century passed before a second church was doomed, — St. Michael's, Crooked Lane, which, with its stately tower and spire, one of Wren's characteristic works, was removed, we suppose necessarily, in 1830, for the northern approaches of new London Bridge. The facility with which this church was got rid of made the fingers of our destructives itch for employment. There are always men who must be busy about something; if there is nothing to build up, they will be equally happy in pulling down. Mr. Richard Lambert Jones was then a leading member of the corporation and the moving spirit in the erection of the new London Bridge. In this capacity he attracted the attention of the Duke of Wellington, who took a warm interest in the bridge, and who, as recorded in Rennie's Life, was struck by Mr. Jones's shrewd common sense and business-like habits. Mr. Jones, having so easily abolished one church, found his appetite whetted, and proceeded, with powerful help, to draw up a monstrous scheme for the extinction of twenty of the city churches. This wholesale demolition, which was justly denounced by the late E. J. Carlos, the veteran London archæologist, in the *Gentleman's Magazine* of 1834, was happily quashed by the decided refusal of Archbishop Howley and Bishop Blomfield to entertain the project; and the churches had rest for a dozen years. Then came the conflagration of the Royal Exchange, followed by the erection of a new and larger building and the remodelling of the adjacent streets. Here two of Wren's best known and historically interesting churches fell a sacrifice to the march of improvement. One of these was St. Bartholomew's, the burial-place of Miles Coverdale, whose tall rugged tower (a relic of London before the fire, to which Wren had added a singular and picturesque cresting of open arches, wisely reproduced by Mr. Cockerell in his new church of the same dedication in Moor Fields) must be fresh in the memory of the older of our readers. Internally it was one of the best of Wren's Basilican churches, "strikingly effective from its harmonious proportions, and the good keeping of all its parts." But not all its architectural merits, nor the ashes of Bishop Coverdale,

could save it. The site was wanted for the Sun Fire Office, and down it came. So, too, did its neighbor, St. Bennet Fink, on the other side of the street, overshadowing Leman's biscuit shop, long famous before Huntley and Palmer had made Reading celebrated by their crisp delicacies. A decagon externally, its domed ceiling was supported by eight Corinthian columns with a very happy effect. It was, in short, a composition which could be ill spared.

This instalment of sacrilege was speedily followed by the ill-starred "Union of Benefices Act," which, however well intentioned, has been so worked as to accomplish a far smaller amount of benefit for the outlying portions of London, which were to be aided out of the ecclesiastical resources thus set free, than the promoters of the measure hoped. The list of Wren's works which have perished is alarmingly large. It includes St. Bennet's, Gracechurch Street, and St. Michael's, Queenhithe, with their tall and slender spires; St. Mary's, Somerset (the truly fine pinnacled tower of which has happily been preserved, though in a sadly uncared-for condition); St. Mildred, in the Poultry (the materials of which were purchased by a former high sheriff of Lincolnshire, to save them from the cement-works, and now lie in his park near Louth, ready for reconstruction); St. Dionis Back-Church, with its Ionic eastern façade, one of Wren's most classical compositions; Allhallows, in Bread Street, whose lovely pinnacled tower not even the memory of Milton, whose baptism is recorded in the register, could save from the operation of the act. Here is the entry: "The 20th day of December, 1608, was baptized John the Sonne of John Mylton, Scrivener." We wonder where the register is now. And last, but not least, St. Antholins, with its delicious spire, a veritable little gem inimitable in its way, has been levelled to the ground, and all its memories of the religious life of the sixteenth and seventeenth centuries wiped out.

Already we are told that St. Mildred's, Bread Street, which has one of Wren's characteristic tall spires, rising from a well-proportioned red-brick tower, and a truly exquisite interior, where a hemispherical cupola is supported on four deeply recessed and caissoned arches, showing Wren's perfect eye for proportion and command of detail, is threatened. Threatened, too, is St. Margaret Pattens, one of Wren's most happy classical adaptations of a Gothic spire, dignified and harmonious, the loss of which to the general view of London, already, as we have said, too much impoverished, would be irreparable. Threatened, too, is the neighboring little church of St. Mary-at-Hill, which, however unattractive in its exterior, which is long subsequent to Wren, exhibits one of his most picturesque compositions internally, and is rich beyond description in the stately oaken fittings carved by the hand of Gibbons. Only the other day, so to speak, when the late Dr. Crosthwaite was rector, large sums were expended on the wood-work of this church, which was then lovingly repaired by Mr. Rogers, who added the exquisite panels to the pulpit, and other delicious pieces in the altar screen and organ loft. But this interesting church, with its stately domed interior — a first sketch as it were of St. Stephen's, Walbrook — and its historical memories of Margaret Beaufort, "my lady the king's grandam," who gave 20s. towards the rebuilding of the old church, and of the abbot of Waltham, whose town mansion stood hard by, on the site of whose kitchen the south aisle was built, and of the many brotherhoods of which it was the seat, the representatives of one of which, the Fellowship Porters, still meet, or did so till recently, for worship within its walls, — this church, where Dr. Young of the "Night Thoughts" was married, and of which Dr. Brand of the "Popular Antiquities" was rector, with a resident rector and well-attended services, is wanted for the Inner Circle Railway, and all architectural and historical considerations are scattered to the winds. The bill for carrying out this project has, we observe, just been abandoned for the present year; but the attempt is likely enough to be renewed in a future session, and we trust that the scheme and its promoters will be vigilantly watched and resolutely opposed. We are glad to know that the rector and the inhabitants are determined not to submit tamely to such a wrong. They will not be robbed of their church without a struggle, and not only are they resolved to fight for their own, but they invite the public to join with them in doing battle for the protection of other churches. At their instance a "City Church and Churchyard Protection Society" has been started, with the view, to quote their circular, of "fighting out the battle in each case where a church or churchyard is threatened with destruction." The earnest protest of Mr. Carlyle against this wholesale destruction, recently issued by the "Society for the Protection of Ancient Buildings," is probably known to many of our readers, and there are few, we think, with any feeling for art, religion, or history, who will not echo his words, that "it would be a sordid, nay sinful piece of barbarism to do other than religiously preserve these churches as precious heirlooms; many of them specimens of noble architecture, the like of which we have no prospect of ever being able to produce in England again." — *Saturday Review.*

ARTIFICIAL MARBLE.

Marble was made by Sir James Hall in 1805 to test Dr. Hutton's speculations concerning the geological effects of heat. In the great war between Werner and the Neptunists against Hutton and the Plutonists, Hutton published his work, "Theory of the Earth," in 1788. Buckle ("History of Civilization," vol. ii., page 411) says: — "He availed himself of the laws which Black had unfolded. One of these laws was that certain earths owe their fusibility to the presence of fixed air in them before heat has expelled it; so that, if it were possible to force them to retain their fixed air, or carbonic acid gas, as we now call it, no amount of heat could deprive them of their capability of being fused. . . . It occurred to him that great pressure would prevent the escape of fixed air from heated rocks, and would thus enable them to be fused, notwithstanding their elevated temperature. He then supposed that, at a period anterior to the existence of man, such a process had taken place under the surface of the sea, and that the weight of so great a column of water had prevented the rocks from being decomposed while they were subject to the action of fire. In this way their volatile parts were held together, and they themselves might be melted, which could not have happened except for the enormous pressure." (We omit the argument referring to geology.) "Sir James Hall determined to test the speculation. . . . He applied heat to powdered chalk, while at the same time, with great delicacy of manipulation, he subjected the chalk to a pressure about equal to the weight of a column of water half a mile high. The result was that under that pressure the volatile parts of the chalk were held together; the carbonic acid gas was unable to escape; the generation of quicklime was stopped; the ordinary operations of nature were baffled, and the whole composition, being preserved in its integrity, was fused, and, on subsequently cooling, actually crystallized into solid marble."

Note 190 says: "The account of these experiments was read before the Royal Society of Edinburgh in 1805, and is printed in their Transactions, vol. vi., pp. 71–185. Edinb. 1812, 4to. The general result was (pp. 148, 149) that a pressure of fifty-two atmospheres or 1700 feet of sea is capable of forming a limestone in a proper heat; that under eighty-six atmospheres, answering nearly to 3000 feet, or about half a mile, a complete marble may be formed; and, lastly, that with a pressure of one hundred and seventy-three atmospheres, or 5700 feet, that is, little more than one mile of sea, the carbonate of lime is made to undergo complete fusion, and to act powerfully on other earths."

So also, p. 160: "The carbonic acid of limestone cannot be constrained in heat by a pressure less than that of 1708 feet of sea." — *Evening Post.*

HOW ARCHITECTS ARE ESTEEMED IN THE WEST.

Minneapolis, Minn., March 11, 1879.

To the Editor of the American Architect: —

Having recently come West, I am somewhat amused at the views of both architects and outside parties in regard to competitions, and send you herewith copies of some letters recently written in this city, and also some extracts[1] from the St. Paul *Pioneer Press* of late dates, which go to show the estimation in which the profession is held in this section. Yours, etc. F.

Minneapolis, Minn., February 15, 1879.

Messrs. ———

Dear Sirs, — We are to build a three-story store building, cost not to exceed $5,000. If you would like to make competition plans for same, please call and see us.

Yours, etc. ——— ———.

Minneapolis, Minn., February 16, 1879.

Messrs. ———

Gentlemen, — We are in receipt of your favor inviting us to enter into competition for your proposed business block. In reply we would say that we are not so situated at present as to undertake the labor involved on uncertainties; but, recognizing the compliment paid us, we can do no less than reciprocate.

We hope soon to enter into a litigation to obtain an amount not exceeding $5,000. If you would like to enter into competition with a few other attorneys for the commission of pleading our case, please call and see us. It is true that several of the parties with whom we invite you to compete have little or no acquaintance with the statutes of Minnesota, having been in the place but a short time, and having come into court but once or twice during their residence here; but they being in need of experience of local matters, which it is evident can never be obtained younger, we make no doubt that if either of the other competing parties can make it seem to us that we desire his services rather than yours, you will be gratified at the opportunity of contributing your time and labor to the good cause.

Yours, etc. ——— ———.

PUBLICATIONS RECEIVED.

Royal Institute of British Architects. Transactions for 1878–79. No. 7. Discussion of Mr. Penrose's paper on St. Paul's Cathedral. The Connection between Ancient Art and the Ancient Geometry, as illustrated by the works of Pericles. By J. Pennethorne.

Proceedings of the Engineers' Club of Philadelphia. Vol. I., No. 1. Published at the Rooms of the Club, 10 North Merrick Street. January, 1879.

[1] These extracts are noticed in this number's Summary.

The American Antiquarian, a Quarterly Journal devoted to early American History, Ethnology, and Archæology. Vol. I., No. 3. Cleveland: Brooks, Schinkel & Co.

Town and Country Mansions and Suburban Houses, with Notes on the Sanitary and Artistic Construction of Houses; illustrated by thirty plates, containing plans, elevations, perspectives, and interior views of executed work in the Queen Anne, Classic, Old English, Adam's, Jacobean, Louis XVI., and other styles. By William Young, Architect, author of "Picturesque Architectural Studies," "Spon's Architects' and Builders' Pocket-Book," etc. Folio. London and New York: E. & F. N. Spon. 1879. Price, $12.50.

Fire-Proof Frame Buildings, an entirely new system. John J. Schillinger.

NOTES OF EXPERIENCE AND INEXPERIENCE.

8. Stucco-Work Moulds. — The materials used in making moulds for stucco-work are beeswax and resin, which are melted together, care being taken not to let them come to a boil, in proportions which vary according as they are exposed to one degree of atmospheric temperature or another. Thus in winter the mixture should consist of equal parts of beeswax and resin, while in summer one part of beeswax should be melted with two parts of resin. The reason for varying the proportions is that the beeswax, if in excess, is likely to become so softened by the heated air and the heat generated by the liquid plaster before it has hardened, that the face of the mould is destroyed if used for two or three successive casts; so that in the summer time a workman requires three or more moulds of the same pattern in order not to lose time. In winter the mould often becomes brittle and is liable to break, when, as is sometimes necessary, it is strained or bent as the cast is being removed. This brittleness the workman can overcome by heating the mould with warm water. After all, judgment and experience will cause the workman to vary the proportions of his mixture according to the size and character of the work to be moulded, as well as according to the temperature. J. M.

14. Portable Water Heater. — In one of the early numbers of the *American Architect* was described an English apparatus of small size, by which a large number of gallons of water could be heated almost instantaneously. In fact, cold water poured in at one end became hot water before it reached the other end. This was effected by passing the water through the interstices between coils of exceedingly small copper tubes, through the bores of which the heat from a gas-burner escaped to the air above; the essence of the invention lying in exposing an exceedingly thin film of water to a highly heated surface. The apparatus was invented by a Mr. Maughan. Is such a thing to be found in this country? or any apparatus which will accomplish the same result inexpensively? What I want is an apparatus that will heat within a reasonable time, by fire, gas, or oil, ten or fifteen gallons of water; but I don't want to go to the expense of a water-back, boiler, pipes, etc. Were I in Paris, I could easily find what I want, and I feel sure that some of your readers can tell me where such an apparatus may be found, or can suggest some way in which I can get a cheap Hot Bath.

15. Oil Stain. — What will take an oil stain out of a piece of ash veneer? It is thought that the oil was spilled upon the backing, upon which the veneer was glued, and has since that operation been absorbed by the veneer until it makes an unsightly stain in plain view. F. L. P.

16. Terne Plate. — What is the difference between tin plate and terne plate, and under what conditions should one variety be used in preference to the other? Roofer.

NOTES AND CLIPPINGS.

A Correction. — The monument, which we stated last week was to be erected to the memory of Wallace and Bruce, is to perpetuate the fame, not of Edward, the brother of the king, as stated, but of Robert, the king himself.

Brooklyn's Fire Record for 1878. — The following statement shows the number of fires, loss on buildings and contents, and the insurances, for the year 1878: Total number of fires, 449; total amount of loss, $391,917; total amount of insurance, $1,654,900.

The following were the causes, so far as they could be ascertained: Defective flues, 75; kerosene oil lamps breaking and exploding, 66; carelessness with lights, matches, hot ashes, etc., 39; chimney fires, 27; gas jets coming in contact with curtains, goods, etc., sparks from chimneys, furnaces, etc., 17; children playing with matches, 17; incendiary, 16; leak in oil still, 12; explosions of gas, 5; overheated stoves, 5; bonfires, 4; kerosene stoves, 4; spontaneous combustion, 4; slacking of lime, 3; overheated machinery, 3; lightning, 3; lighting fire with kerosene oil, 2; miscellaneous, such as the boiling over of varnish, meat falling on a fire, bursting of steam pipe, etc., 20, and unknown, 105.

The Bennington Monument. — The Governors of Vermont, New Hampshire, and Massachusetts have, through the New England Society of New York, issued an appeal to the people of New England to help raise the sum of $45,000 for a monument to be built at Bennington, as it is found that the appropriation voted by the legislatures of these three States, which amounts to $27,000, is not enough to provide a suitable monument.

Ancient Milanese Aqueducts. — In making excavations for a new system of sewerage, Signor E. Bignami Sormani has found well-preserved remains of two ancient aqueducts, which were evidently used for conveying fresh water, probably for the supply of fountains and other domestic uses in early palaces or villas. The pipes are of terra-cotta, and Signor Sormani is inclined to refer them to the time of the Roman Empire, the form, mode of construction, and general details being indicative of a great antiquity. — *Il Politecnico.*

The Reconstruction of the Patent Office. — In consideration that the designs for the fire-proof reconstruction of the Patent Office Building within the old walls, made by Messrs. Cluss and Schulze, architects, of Washington, were designated by the commission of experts, appointed under the act of Congress dated June 20, 1878, as "the best practical answer to this requirement," and that the subsequent appropriation of money by Congress for the work was based upon these plans, the board of supervisors have selected Mr. Adolf Cluss, the senior member of this firm, as engineer and architect of the restoration of the building. This action was taken because it was decided to hold one man individually responsible, rather than a firm.

The Inter Oceanic Canal. — The International Congress which is to meet at Paris, May 15, to discuss the different routes by which it is proposed to cut a canal through Central America, is likely to be fully attended. The views supported by the United States government, so far as it supports any views, will be maintained, probably, by Admiral Ammen, Commodore Selfridge, who is in command of the Mediterranean squadron, Commander Lull, and Mr. A. G. Menocal, a civil engineer attached to the United States navy. The American Geographical Society, of New York, has been invited to send delegates, one of whom is likely to be its president, Judge Daly. The United States Board of Trade will send Messrs. Nathan Appleton and Frederick M. Kelly; and the Chambers of Commerce in the large cities are not unlikely to be represented by their own delegates.

The Unsafe Bridge at Brunswick, Me. — A commission appointed to examine the iron bridge between Brunswick and Topsham, Me., built by the King Bridge Company, and declared by Professor George L. Vose, of Bowdoin College, to be unsafe, has reported that the bridge at present is "tolerably safe" for ordinary travel; but would be certainly crippled, and probably destroyed, by a close pack of people or cattle covering any one span.

The Houses of Parliament. — In one of his Royal Academy Lectures on Architecture, Professor Edward M. Barry, R. A., lately took occasion to say: "The most important civic edifice erected in our own time has undoubtedly been the Houses of Parliament. This was a work extending over some twenty years, requiring the best part of the life and energies of its architect. I will not now speak of its architectural merits, nor am I about to discuss the views of those who, on the one hand, declare it to be the most successful result of the Gothic revival; nor the judgment of others who hold a diametrically contrary opinion. I wish to refer to it only as one of our greatest public monuments. It is a building which provides for the highest business of the country. The monarch addresses from the throne the Houses of Lords and Commons, and through them the listening world. The so-called private business of the country, business affecting the comfort of the nation and the expenditure of millions upon millions, is transacted within its committee rooms. Some of the highest officers of the commonwealth reside in it. Taking the building as a whole, there is no spot in the empire of equal interest. In this case, if in no other, we might have thought that considerations of expenditure might well have been made subservient to efficiency and to artistic considerations. A few people are forever talking of the cost of the Houses of Parliament rather than of their artistic merits or defects. On the question of expense, the common assertion is that it cost two millions. Two millions expended in twenty years, — a hundred thousand a year, out of an annual expenditure of eighty millions, for housing the legislature of a great empire; about the same sum which our neighbors the French have spent, with a *cœur leger*, in as many months, on the evanescent splendors of a great exhibition, to say nothing of an almost equal outlay on their new opera house. Two millions, — a third part of the sum expended in preparation at the first whisper of war; a fraction of the cost of a single iron-clad squadron! In truth, the building of the Houses of Parliament, as designed by the architect, did not cost two million pounds; but the assertion has been made so often that by repeated iteration it has come to be accepted as correct. Be it less or more, the great question with respect to such a national monument should, as it seems to me, have been rather 'Is it good?' than 'What did it cost?'"

An Archæological Find. — A huge stone, somewhat in the shape and the dimensions of a mummy case, which was roughly hewn into the appearance of a female deity, probably an idol worshipped by the old pagan inhabitants of the island, was recently discovered in the Church of Sainte Marie du Castel, in the Isle of Guernsey.

The Tower of Belem. — *Le Technologiste* states that the ancient Tower of Belem, which was used as a state prison, and forming part of the Hieronymite monastery near Lisbon was a part of one of the most interesting Gothic monuments in Portugal, fell in ruins December 18, burying in its fall an unknown number of persons. The construction of the splendid and costly Mooresque gallery, inlaid with jasper and mosaic, which was to have completed the monastery as designed by its original builders, was nearly finished at the time of the accident. Our readers will remember that the façade of the Portuguese section at the late Paris Exhibition was a reproduction of a portion of the famous monastery.

Gypsum in Cement. — During the past decade, the use of gypsum for the improvement of ill-burnt Portland cement has attracted some attention. Herr F. Schott gives the following results of experiments: —

	Weight.	Tenacity, after 7 days. Air.	Water.
Pure cement	100	10.5	8
" " with 1 per cent unburnt gypsum,	115	14.0	—
" " with 3 per cent " "	120	18.0	10
" " with 1 per cent dead burnt "	112	11.0	—
" " with 3 per cent " " "	113	12.5	—
" " with 3 parts sand,	—	8.0	6
" " with 3 parts sand, and 3 per cent of unburnt gypsum,	—	13.0	7

Dingler's Journal.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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CONTENTS.

IT has been satisfactorily demonstrated that it is impossible to build a tenement house on a city lot, 25 by 100 feet, in such a manner as at the same time to secure for its owners a profitable investment, and for its occupants all the requirements of physical and moral health. Of course the best result of a competition of plans, which can have no better culmination than the ingenious designs which we reproduced last week from the *Plumber and Sanitary Engineer*, should be a legislative enactment forbidding the erection of buildings under similar conditions. We understand that the committee appointed at the meeting called by the mayor of New York, to consider the question of tenement house reform, has recommended some legislation to promote decency of living among the poor, and we trust that we shall find among their propositions some such provision as we have named. We now learn that another and no less admirable issue of this movement for reform is the formation of an association in New York, to build tenement-houses somewhat on the plan of the Peabody tenement-houses in London. This association is to be a stock company with a capital of a million dollars; of which, when the organization is completed, ten per cent is to be paid in and devoted to the building of a model tenement-house; if this proves a profitable investment, it will be followed by a second call of ten per cent, and a second building; and so on until the capital stock shall have been expended. Of the profits above six per cent one third is to be distributed among the best tenants, to encourage cleanliness of living and promptness of payment; and the other two thirds will constitute a reserve fund for the erection of other buildings. This proposition seems in intention to be wise, practicable, and business-like; but the whole success of the enterprise must be largely influenced by the character of the first experiment.

THE first model tenement-house proposed by this organization is to be built somewhere between Sixtieth and Eightieth Streets, and between Second and Ninth Avenues, in the city of New York, upon sixteen city lots at the end of a block, thus giving a frontage of 200 feet on three streets. It is proposed to build five stories, with a central courtyard 100 feet square accessible directly from each of the three streets, to have ample stairways and passages, several elevators, all rooms to be large and lofty, and to receive direct light and air from the street or the court, and the side towards the middle of the block to be recessed in the centre so as to afford an area for air and light to the apartments facing in that direction. The building is to be in charge of a janitor who will enforce all necessary sanitary measures. The drying of clothes is to be done on the roof, which is to be surrounded by a parapet of brick six feet high. We understand that no definite plans have as yet been submitted. But, if we must have a competition of plans, no better programme than this could be opened, none in which the exercise of ingenuity and skill could have a more abundant opportunity, and be followed by results more useful and important to public health and morals.

THE special legislative committee which has been investigating the condition of the dome-piers of the Hartford Capitol has rendered its report to the General Assembly, and has given its verdict in accordance with the facts we have already stated. After recounting the manner in which the piers were built, altered, rebuilt, and at length repaired, and after stating that the immediate cause of the spalling and disfiguring of the granite was the substitution of narrow joints laid with lime paste, for wider joints laid with cement mortar, the committee goes on to say that "while the evidence shows that the chief and almost the entire direct responsibility for the defects in the dome-piers falls upon the deceased superintendent," it is also of the opinion that "the contractor was bound to have ascertained definitely whether the superintendent had any authority from his superiors for making the extraordinary and most dangerous changes, against which the contractor so properly and persistently remonstrated;" or that failing to have ascertained this, he ought to have refused to do bad work on the piers. Behind this condemnation of the superintendent and censure of the contractor it is barely possible to discern an implied censure of the Commissioners and the consulting engineer for negligence. We do not know whether this is the end of the matter, or whether suits will be brought against the estate of the superintendent or against the contractor and his bondsmen, but if anything of this sort is done, we cannot help feeling that the consulting engineer and the Commissioners ought to be made parties to the defence.

MR. BATTERSON'S defence before the investigating committee was an able and, in the main, a very temperate argument, and deserves mention, as it brings to light some curious statements. Because Mr. Batterson, who afterwards became the contractor, had submitted designs for the capitol in the first and second competitions, and might think himself entitled by this fact to express an opinion as to how the building should be carried out, it was thought best to bind him with the utmost stringency to the mere execution of the work specified by the architect or directed by the superintendent, who by the terms of the same contract was clothed with unusual power, for he, and not the architect who prepared them, nor the contractor who was to execute them, nor yet the commission which was to be ultimately responsible for their proper execution, was made the sole interpreter of the plans and specifications. When it was decided to build a dome, instead of a clock-tower, the sections of the specification which were to govern the construction of the tower were useless, and the cost of all labor and material which would have been expended on its construction was charged to the contractor as "omitted work," while the architect prepared new specifications for the dome. This the contractor, with a seeming justice, construes as an abrogation of that part of the specification which called for such labor and material. The Commissioners have sought to throw the responsibility for the failure upon Mr. Batterson for having disregarded certain things required only by the first specification; while Mr. Batterson maintains that this specification having in a manner been annulled, and having become, as far as he was concerned, only a matter of debit and credit in his ledger, he cannot be held derelict of his duty. But he goes too far: for he also declares that as the commissioners, although they profess never to have cancelled the first specification, formally adopted the new specification, they are bound by its provisions, while he himself is not bound by its conditions, inasmuch as it was never delivered to him. Mr. Batterson, then, voluntarily places himself in the position of a contractor who executes an important and costly piece of work on the authority of verbal instructions from a superintendent, and this in the face of the fact that the drawings and specifications are made part and parcel of the contract, on the proper execution of which depends his remuneration. The logical inference to be drawn from this position of Mr. Batterson is that, professing to feel himself unbound by the first specification, and maintaining that the requirements of the second specification are of no effect as far as he is concerned, he has been doing work for which he has not a contract and for which consequently he cannot claim payment.

THE Boston Chapter of the American Institute of Architects has, by invitation, united with the Boston Art Club and with the School of Drawing and Painting, with the object of holding a general exhibition of contemporary art in the new wing of the Museum of Fine Arts in that city, which has for this purpose been generously placed at their disposal by the trustees. An unusually

large proportion of the space available has been assigned to the architectural department of the exhibition, and it is important to the profession to justify this recognition of its position in art by a generous contribution of such drawings and designs as shall illustrate the present condition and aspirations of American architecture. To this end the Boston Chapter has sent to the profession in its neighborhood, as well as to the secretaries of the chapters in other cities, for appropriate distribution, a circular, which we print elsewhere, setting forth the objects of the exhibition, soliciting the coöperation of the profession in all parts of the country, and explaining the conditions of delivery and of return of contributions. The exhibition is to open April 22, and no contributions can be received after April 12. An opportunity so conspicuous for increasing the public interest in works of architecture and decoration should not be allowed to pass by unimproved. It is worthy of observation, by the bye, that the general presumption in the profession that only pictures of architecture, and not plans, geometrical elevation, sections, and details, are acceptable to the public is not sustained by facts. The unexpected general interest evinced in the exhibition of the competitive plans for tenement-houses in New York seems to show that pictorial demonstration is not the only way by which architecture can make itself interesting to the laity.

If fire-proof building is to become the rule in this country, it will be brought about quite as much through the demands of the different boards of fire underwriters as through the efforts of architects; for even the most reckless American, careless as he may be of the lives of his tenants and the rights of the owners of neighboring buildings, can understand the disadvantage of insuring at high rates, or perhaps of not being able to insure at all. It is for the pecuniary interests of the companies represented by these boards that a better style of building should be enforced, and they have taken up the matter in a purely mercantile spirit, and have made investigations and experiments which have been of very great interest and value. It is quite possible that they could in time bring about the desired reform in building unaided, though it is not for the honor of the profession that they should move forward alone. The latest step towards protecting their own interests, which in a different way are the interests of the public, has been taken by the New York Board of Underwriters, which has petitioned the mayor of Brooklyn to veto the action of the aldermen in resolving to replace with naphtha lamps the present gas-lights on the streets and public places. Aside from the objectionableness of returning to an obsolete method of street lighting, which after all may not prove more economical than the present system, since more lamp-lighters will be needed to do the work, the proneness of naphtha to burn badly in very cold weather, and the danger of explosion of single lamps, or of any of the many places where each lamp-lighter must store his supply of the dangerous fluid, the Board says that it is well assured that the fire loss will be increased $200,000 per annum, and consequently the insurance rates must be raised. In this connection it is well to recall that the incendiaries who have lately caused such a panic in Columbus, Ohio, that the military were called out, have confessed that they obtained from the street lamps the naphtha they used.

Our summary of news would be incomplete without the usual record of disaster from shoddy building. This time we have a demonstration from Louisville, Ky., where, on the night of the 16th inst., a new tobacco warehouse, containing about 300 hogsheads of tobacco, collapsed and fell into ruin. The local journals say that its walls had been considered dangerous, but that "several engineers" had pronounced the structure perfectly safe. It is commendable, of course, in the owner to proceed immediately to rebuild or repair, as the papers have it, so that the business of his tenant may be interrupted as little as possible; but we as yet hear no word of indignant rebuke at the criminal poverty of the building, or at the criminal carelessness of the builder, and nothing is said of any intention to build better. We shall be happy to record the proceedings of a prompt and thorough inquest into the causes of the disaster, and a prompt punishment of the delinquents through whose avarice, or carelessness, or short-sightedness, it became possible.

The Paris *Economiste Française* gives some ingenious statistics having a bearing upon the opening of a canal through the Isthmus of Darien, and its influence upon the commerce of America and Europe. From these it appears that ships of our Atlantic coast would, by the use of the proposed canal, gain thirty-three per cent over those of England in the voyage to San Francisco, twenty-eight and thirty-two per cent respectively in the voyage to Shanghai and Hawaii, forty-eight per cent to Valparaiso, and fifty-one to Callao; where now this advantage is ours by only from three and a half to seven per cent. The substitution of steamers for sailing vessels would add forty-four per cent advantage for Atlantic over European tonnage. The use of this route would thus not only enable us to obtain all our goods from Pacific ports direct, and greatly encourage our trade, but would render it possible for ships starting from American ports to load in China or Valparaiso, and deposit their cargoes in Liverpool a week in advance of ships starting on the same errand from English or French ports. With this advantage, it is argued, all the commerce of the Pacific would flow into this channel and contribute directly to the establishment of an American supremacy in the largest trade in the world. It is contended, therefore, that even with the assistance of M. de Lesseps, it will be impracticable to induce English capital to venture on the enterprise of opening this canal as proposed. It would not only inflict a permanent injury on British commerce in this direction, and depress the value of the Suez Canal, but, as the Philadelphia *North American* claims, by facilitating the introduction of American manufactures into Western South America, and into China, Japan, and Australia, it would ruin the manufactures of Great Britain. Apparently, no great public enterprise now contemplated can be compared to this in the importance of its results to our commercial prosperity. The physical possibility of it we have more than once had occasion to refer to, and now, if these magnificent predictions shall prove capable of verification, our duty to undertake this task ourselves, and not to wait for the assistance of foreign capital, would seem to be plainly set forth.

What to do to preserve the famous paintings by M. Paul Baudry, which form the most attractive feature of the too magnificent *foyer*, or crush-room, of the New Opera House at Paris, is still to be decided. Beyond question they are being injured by the smoke and heat from the gas which lights the room; equally beyond question, as it seems to us, they are unfortunately placed and unsuited to their surroundings, for it is very difficult to get a satisfactory view of them, and when they are seen, one is possessed with disappointment that the strong color and gorgeousness of the rest of the room so seriously interferes with one's enjoyment of paintings which are in themselves beautiful and harmonious. This want of harmony between the room and its principal decoration betokens a serious blunder which must be shouldered either by M. Baudry, because he disregarded the key of color fixed by the architect, or else by M. Garnier, if his part was done after the key had been fixed by M. Baudry's work. Several remedies are proposed, for it is now evident that in six or seven years more the damage will be irreparable. One scheme is to glaze the paintings with some varnish which can resist the attacks of heat and acid gases; but this is thought to be impossible without destroying the artistic merit of the work. The scheme of replacing the paintings by mosaic reproductions has been tried, but the medallion which was reproduced was so grotesque that the idea has been abandoned. Still another scheme is to replace M. Baudry's paintings by more ordinary decorations, the work of the scene-painter. Giving up gas and using the electric light is more favorably considered; for although the Jablochkoff candle is too clumsy for such a place, the Reynier lamp can be made to take a form in harmony with the surroundings; moreover, the predominance of violet rays in the electric light can be counteracted by using globes of such a color as will intercept the superfluous violet rays. This seems a very satisfactory solution, and, provided the subdivision of the electric light can be properly accomplished, may be adopted.

Still another scheme, one which is favored by M. Baudry himself, is to remove the paintings to some building, the Hôtel de Ville or the Tuileries, for instance, where they can be more suitably installed, while accurate copies can be prepared for the *foyer*. The only artist who, unaided, could satisfactorily replace these paintings, which cost forty-eight thousand dollars, is M. Baudry himself, but this task he does not for a moment think of undertaking. He offers, if the sum of twenty thousand dollars is placed at his disposal, to have good copies prepared

under his personal supervision by the following method: The large photogravures of the original panels, which were prepared by Goupil & Co. before these panels were put in place, are to be accurately colored, as indeed they have been already with remarkable success, and then copied upon canvas, the enlargement being made in the ordinary way by division into squares; while the outlines can be transferred to canvas by the aid of the magic-lantern, as at Albany. The matter of coloring the copies can safely be entrusted to the pupils at the École des Beaux-Arts, under M. Baudry's eye. This process will insure absolutely faithful reproductions, for all the distortions of figures and accessories which the artist provided, to counteract the distortions which curved vaults and coves would otherwise have caused, are accurately represented by the heliogravures. Meanwhile, while it is yet undecided which course to pursue, the paintings are to be engraved on copper at the expense of the Government.

THE OPEN FIRE-PLACE. IX.

THE MOVABLE GRATE.

FIG. 63 represents the movable grate, invented by Bronzac. The fuel rests on a small carriage with wheels or casters, which allow of its being brought forward into the room, when the fire is once lighted and burning well. The grate or carriage consists of a cast-iron box, open in front, and was used with an ordinary fire-place of Lhomond or Rumford. These grates, according to Peclet, well made at first, met with great success, but upon the expiration of the term of the patent right their construction was less careful, and they fell into comparative disuse. At the Universal Exhibition of 1855, an apparatus of the same nature was exhibited. The grate could be brought forward several meters into the room, the smoke then passing into the chimney through a flue formed of sliding tubes, fitting into each other like those of a telescope. As to how far the use of such a device is likely to spread in our modern apartments is a question of which each is best able to judge for himself. But it seems to the writer more suitable for the shop of the tinsmith or the laboratory of the chemist than for an ordinary living-room.

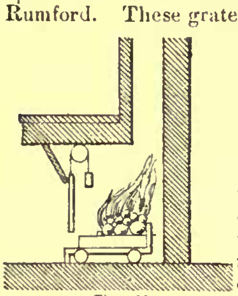


Fig. 63.

Various other forms of the movable grate have been invented, a common form among which is the hanging-basket grate, now occasionally used, supported by a chain on a swivel bracket projecting from one of the jambs of the fire-place. This form of grate is objectionable on account of the difficulty of holding it firmly while replenishing or poking the fuel. It is sometimes used on account of its oddity or picturesqueness.

FIRE-PLACE WITH INVERTED SMOKE FLUE.

In 1745 Franklin invented the famous Pennsylvanian Fire-Place (Fig. 64), in which the smoke descends to the bottom of the fire-place before it enters the flue, in order to heat the surfaces of the fresh air channels enclosed in the fire-back. This fire-place of Franklin's, however, was closed in front, and was objectionable on that account, the fire not being visible. It belongs therefore rather to the stove family than to that of the fire-place, as its name implies. It was modified by Desarnod, who opened the front to expose the fire (Fig. 65), and added on each side three little tubes which entered a larger one, through which the smoke passed and gave out a large part of its heat before entering the chimney. In short, the apparatus consists of a small fire-place inside of a larger one. Above the smaller is the opening through which fresh air enters the room. The system of an inverted smoke flue was also adopted by Montalembert, who in 1763 invented the fire-place and chimney represented in Fig. 66. It consists of a small chimney inside of a larger one. Upon lighting the fire, the damper at the top of the inside flue is opened, and that on the outside flue closed, by means of cords and tassels, allowing the smoke to rise directly into the chimney. Once the fire is well lighted, the dampers are reversed and the smoke is forced to follow the course indicated by the arrows. When the walls of these flues are constructed of a good heat-conducting material, the saving by their use may be very great; if constructed of brick and the usual furring put upon the chimney breast the gain is, on the contrary, but slight. Notwithstanding this objection and the complication of the construction, these chimneys became quite popular at the time of their introduction.

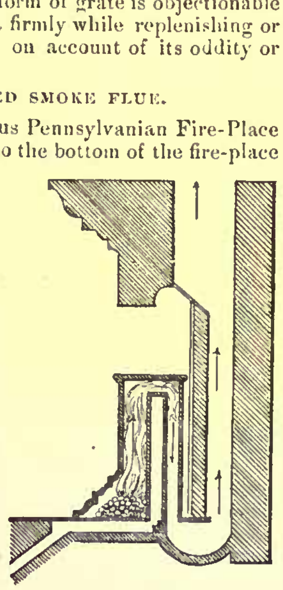


Fig. 64. Franklin's Pennsylvanian Fire-Place.

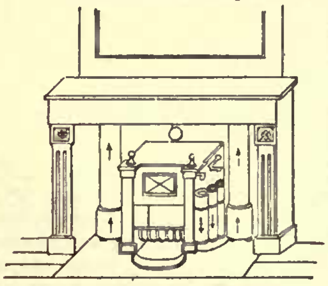


Fig. 65. Desarnod's Fire-Place. From Joly.

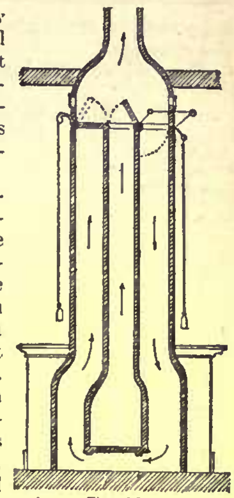


Fig. 66.

The chief difficulty with all these arrangements having the reversed draught is their liability to smoke, and to clog with soot. Where the principle of multiplied circulation is employed to bring the fresh air and smoke flue in contact with each other, the circulation should if possible be on the part of the fresh air and not of the smoke, unless convenient openings can be provided for cleaning out. Another form of fire-place, constructed on the same principle, is that of Douglas Galton, represented in Figs. 67 and 68. In this the fire-place projects entirely into the room. The smoke passes through the large central flue, and is surrounded by fresh-air chambers, which bring the warm air into the room through the openings shown in the section at the top of the stove, following the direction shown by the arrows. The fire-place is constructed of fire-brick, which absorbs a great quantity of heat, and, when once thoroughly warmed through, has the peculiarity of radiating the heat in all directions very rapidly. Soapstone has the same property. The grate and case of the fire-place are made of iron. This apparatus can only be employed with safety where the chimney draught is very regular and powerful, the vertical flue being heated from some external source, as in the Herbert Hospital, Woolwich, England, where, by the side of the upright flue, is placed a spare flue terminating in a fire-place in the basement, which enables the vertical flue to be warmed, so as either to make it draw when the fire is first lighted, or to enable a current to be maintained for ventilating purposes through the fire-place when the fire is not lighted. The horizontal flue is swept by pushing a brush along it to force the soot into the vertical flue, whence it can be removed by a special contrivance.

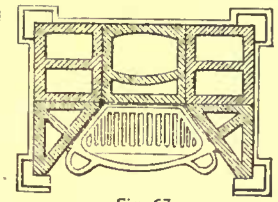


Fig. 67.

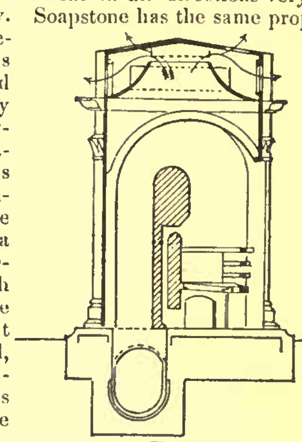


Fig. 68.

The fire-place of Descroizilles, with smoke flue constructed on the same principle, is shown in Fig. 69.

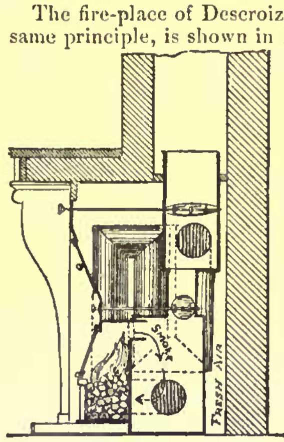


Fig. 69. Fire-Place of Descroizilles.

In order to diminish the unnecessary entrance of cool air into the chimney flue above the fire, without at the same time curtailing the view of the flame, Descroizilles closed the upper part of the opening with a curtain of fine metal gauze. This, applied to both wood and coal fires, gave excellent results. Glass and mica slate have been used for the same purpose, but, owing to their frangible nature, have had but a limited use. The apparatus for warming the fresh air shown in the figure is much too complicated ever to become popular, even if it were not objectionable in many other particulars. The whole is constructed of metal. The metal gauze in front of the fire is made to turn on a hinge on its upper side, so that it may be opened or closed at pleasure. The smoke is allowed to pass directly into the chimney when the fire is first lighted, but when the flue has been sufficiently warmed to insure a good draught, the small damper above the fire is closed, and the smoke is compelled to descend, turn to the right and left, rise again, and circulate through the bent pipes as shown in full and dotted lines, before it finally escapes into the chimney. While the machine is in good order it warms the fresh air economically and effectually, provided it is not attempted to warm too much air. But it is particularly liable to clog with soot, and very difficult to clean out again, it being necessary to take it entirely apart in order to do this. Moreover, the frequent changes in shape and direction of the various parts of the smoke flue give rise to numerous counteracting eddies, which seriously retard the passage of the smoke; and often to such a degree that, with fire-places having openings of the ordinary size for burn-

ing wood, its use, without the gauze blower, would be quite out of the question.

Fig. 70 gives a simpler device, but one which is also objectionable on account of back eddies, soot clogging, and smoke, without the advantage of the damper leading into the direct flue to fall back upon when the draught is feeble.

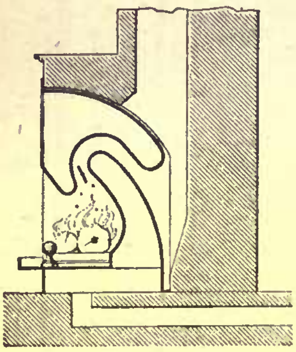


Fig. 70. From Peclet.

Figs. 71 and 72 represent a ventilating fire-place taken from Peelet's Traité de la Chaleur. It is composed of a small fire-place of sheet-iron, placed inside of a larger one containing the fresh air tubes, T T. These tubes are arranged in plan as shown in Fig. 72, in such a manner as to take from the smoke, as it passes between them, as much heat as possible, without obstructing its passage or occupying too much space. The small inside fire-place is distinct from the larger one containing the tubes, so that it can easily be removed

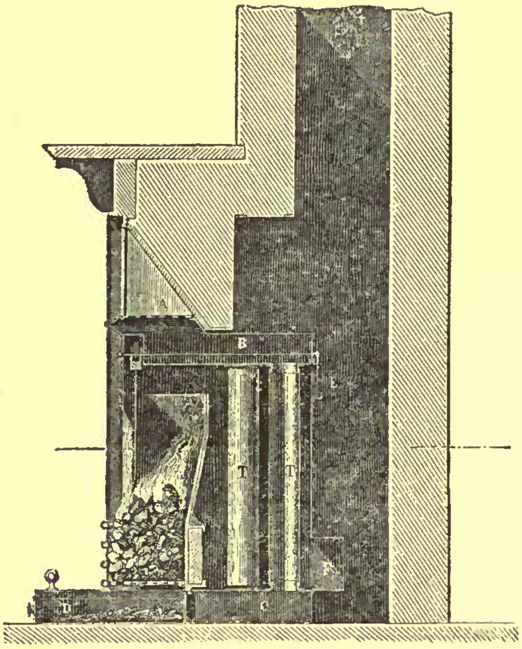


Fig. 71. Ventilating Fire-Place, from Peclet.

when it is desired to clean out the latter. The smoke and hot air of combustion, rising from the fuel, pass over the back of the inside fire-place, descend between the fresh-air tubes, and pass out into the

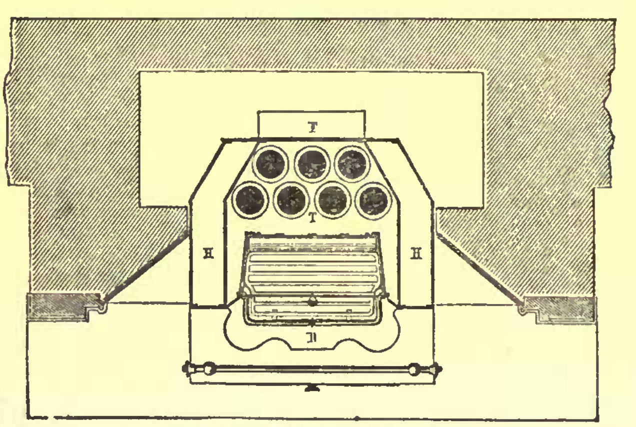


Fig. 72. Plan of Ventilating Fire-Place, from Peclet.

main flue through the large opening at the bottom, F. An opening above E, furnished with a damper, serves to establish the draught when the fire is lighted. The fresh air circulates through the tubes and enters warmed into the room through a register just above the fire. The usual blower for diminishing the size of the fire-place opening accompanies the apparatus. This fire-place is simple and easily set in any ordinary chimney opening. It was tested by Peclet and highly recommended by him.

The reverberatory fire-place, invented by a Mr. John Taylor, an English architect, is represented in Fig. 73. It is constructed of hollow bricks laid round an iron frame in such a manner that the smoke is obliged to pass around and below the fire before ascending the flue. An opening with a damper immediately above the fire allowed the smoke, however, to rise directly into the main flue when the fire was first lighted. The interior of the grate was entirely lined with hollow fire-bricks, and the front part of the grate was provided with openings arranged to correspond with the construction of

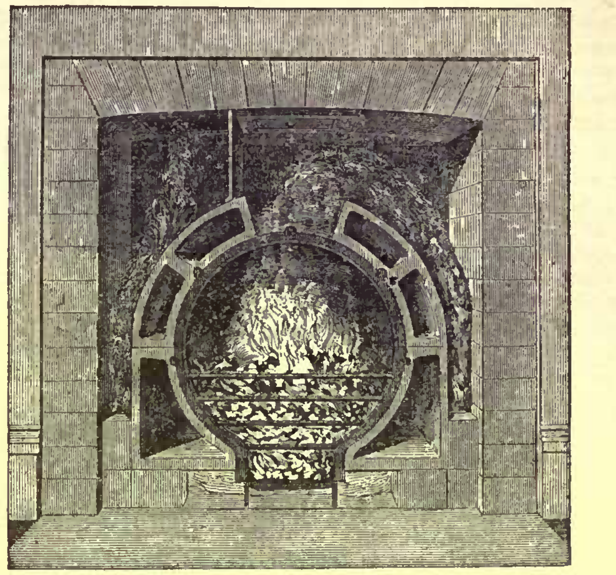


Fig. 73. Taylor's Fire-Place.

the air flues behind, and also to present a highly ornamental appearance. The fresh air warmed in the hot-air flues formed of fire-bricks passed through these openings into the room. This hollow brick interior was heated by the fire resting against the bricks and by the smoke passing around them. The objections to this fire-place were, that the descending flue as here constructed would be liable to smoke, and would quickly become clogged with soot, to remove which would be difficult, especially in the lower corners, where it would soonest condense. Another serious objection was the liability of the hollow bricks to become destroyed by the action of the fire and disturb the whole arrangement. This might be partially removed by the substitution of iron for brick, but such a substitution would involve difficulties of other kinds. On the whole, the deficiencies were conspicuous enough to prevent its making a permanent impression, and it now appears to have become forgotten.

M. Joly, in his Traité du Chauffage et de la Ventilation, says, "When we make a careful examination of our open fire-places as we actually find them, the first thought which strikes us is, 'How absurd they are!' They are indeed nothing more than excellent producers of dangerous draughts, and it is particularly to them that applies the famous proverb, —

'*Si le vent souffle sur toi au travers d'une fente,*
Fais ton testament et mets ordre à ta conscience.' [1]

"The second thought is this: Why not take advantage of the heat at the point where it is most intense, that is, at the top of the fire-place? Why cause the smoke to enter the main flue at a height of 0 meter .70 from the ground, rather than at the height of 1 meter? Why not utilize first all the radiant heat, and then by means of a damper in the smoke-flue just over the fire (Fig. 74), when the fire is lighted and the draught established, why not, as in the Russian and Swedish stoves, turn the smoke into one of the idle piers under the mantel, converting it into a reversed smoke-flue, to lead the smoke under the hearth to the base of the other pier, through which it again rises to the mantel and returns to its starting-point before entering the flue? Why not bring all this smoke in contact with fresh air introduced from the outside, and entering the room through the fresh-air registers, as shown at the right and left of the mantel? This would be more expensive than our ordinary fire-places; but does the fuel that one burns cost nothing? Do we derive from it all the advantage of which it is capable?"

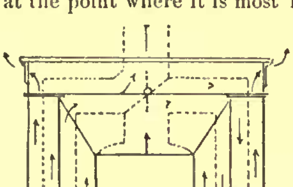


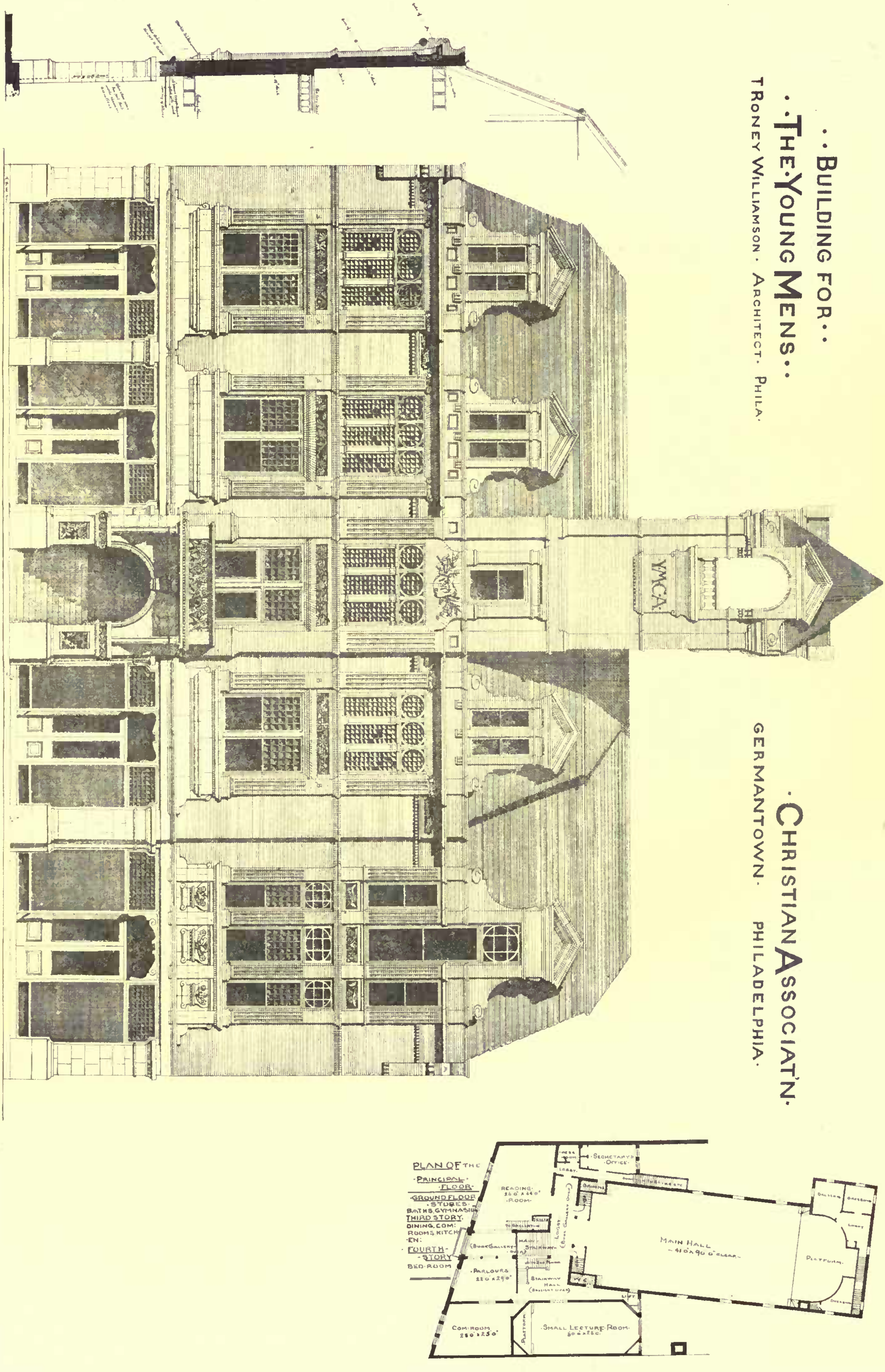
Fig. 74. Suggestion of Smoke Circulation.

THE ILLUSTRATIONS.

BUILDING FOR THE YOUNG MEN'S CHRISTIAN ASSOCIATION, GERMANTOWN, PENN. MR. T. RONEY WILLIAMSON, ARCHITECT, PHILADELPHIA.

The building has a front 90 feet long, and will be the most important edifice in the town; the materials are brick and stone. The ground floor piers, the principal doorway, and the finish at the bottoms of the window bays will be a gray local stone, very soft in tone and partaking something of the nature of the soap-stones as to

[1] If through a crack the draught you feel,
Settle your conscience and make your will

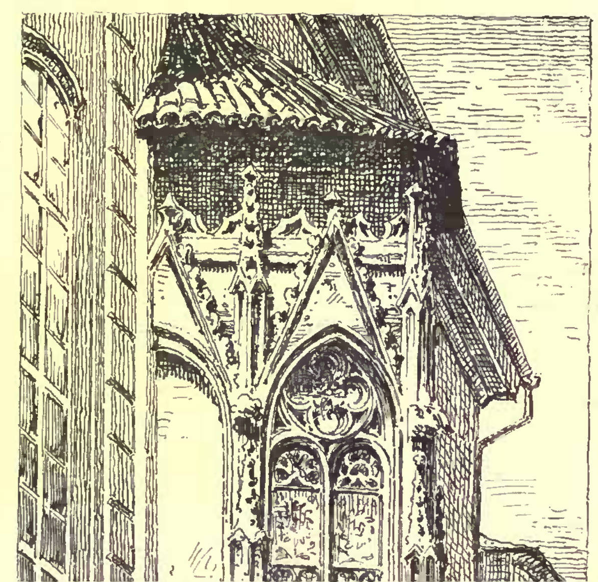


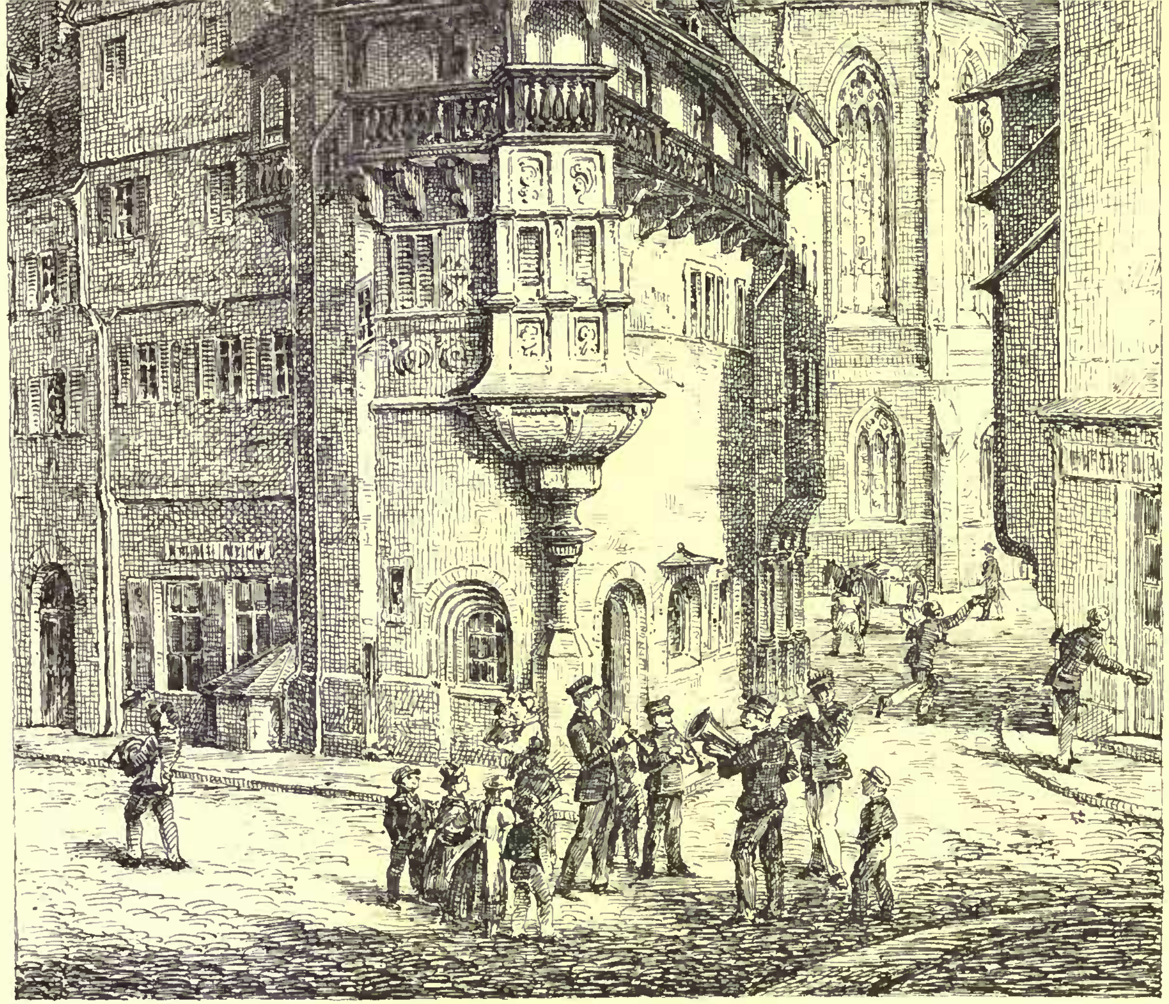
The Heliotype Printing Co. 220 Devonshire St. Boston



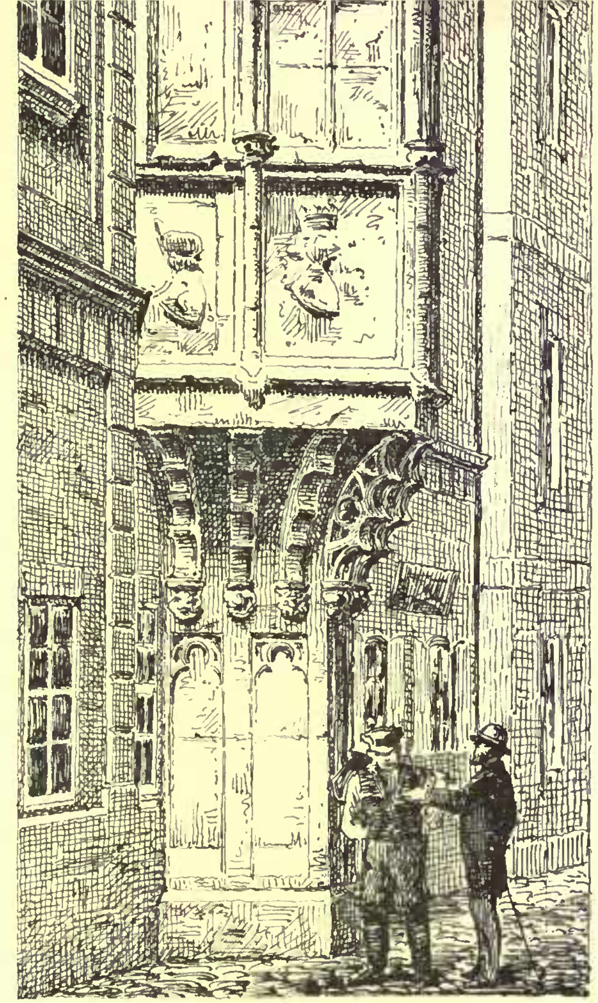
OLD FARMHOUSE IN SÆTERDALEN · NORWAY · [BUILT IN THE YEAR 1650]







A STREET IN KOLMAR • ELSASZ • GERMANY

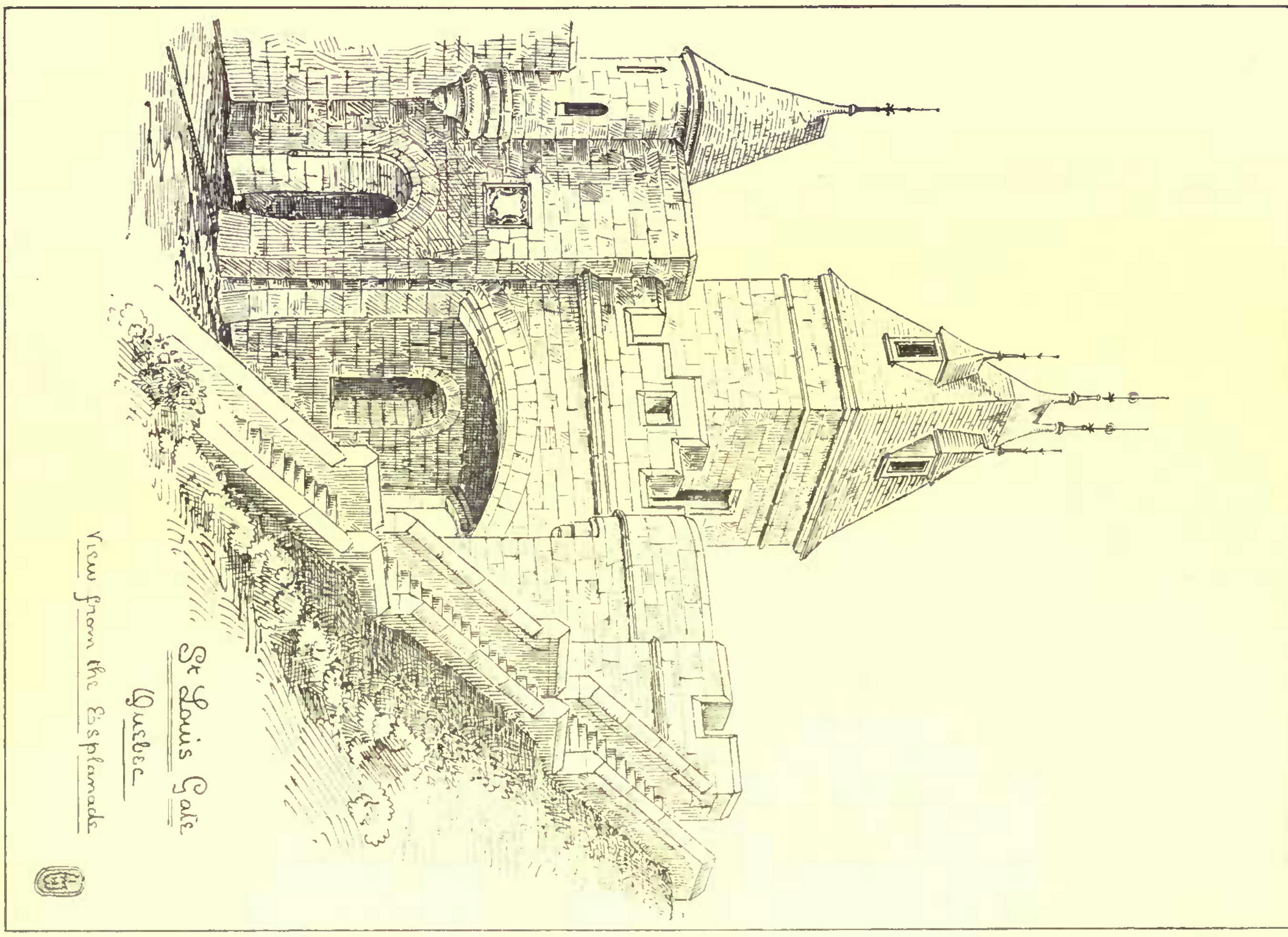


BAY WINDOW FROM THE "CAROLINUM" PRAG

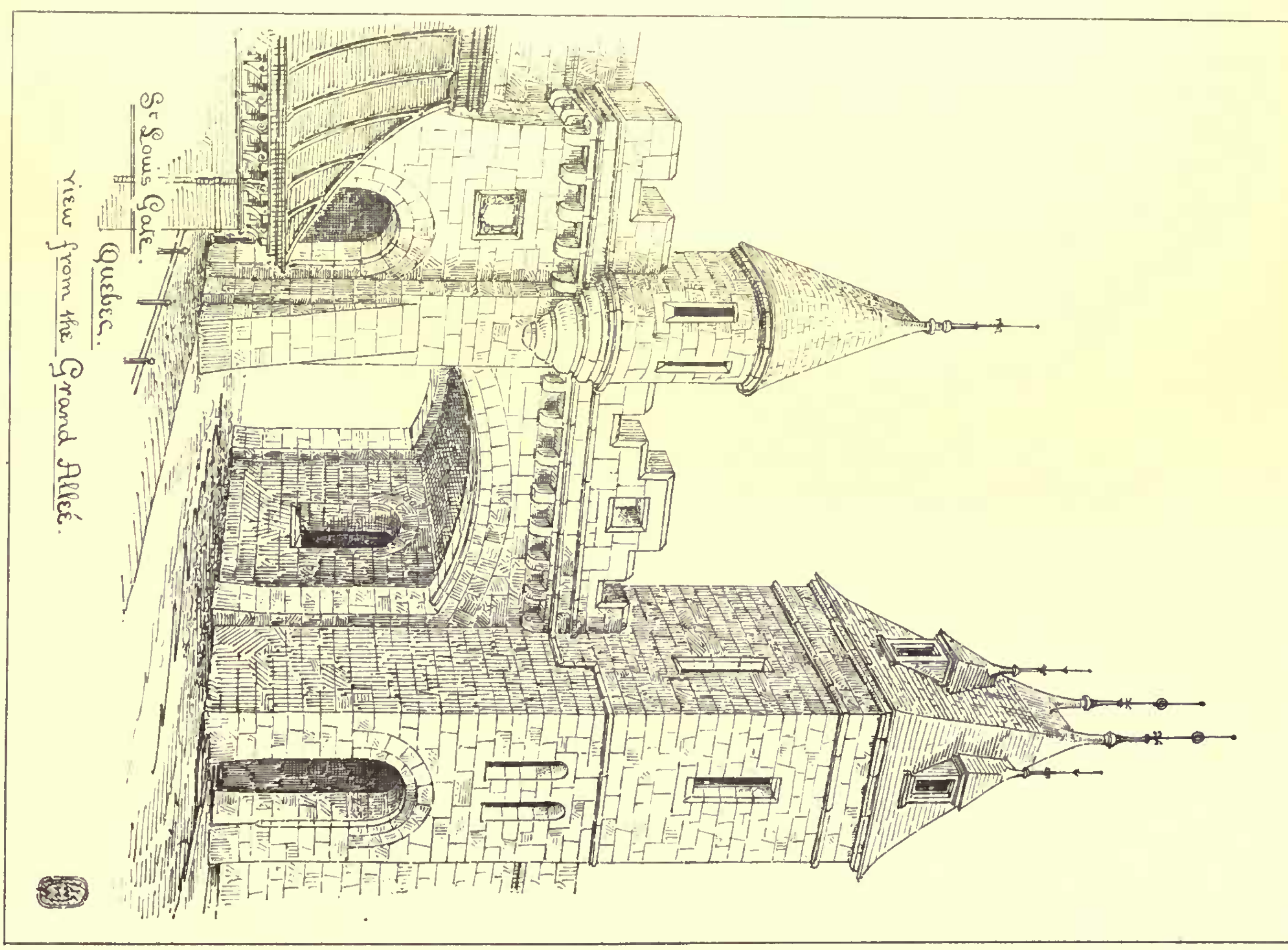
SKETCHES FROM A SCRAP BOOK

L.S. IPSEN DEL.

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON



St Louis Gate
Quebec
View from the Esplanade



St Louis Gate
Quebec.
View from the Grand Allée.

The Heliotype Printing Co. 220 Devonshire St Boston

quality. The rest of the front, strings, caps, cornices, dormers, etc., will be brick, made by the Peerless Brick Co., Philadelphia.

SKETCHES FROM A SCRAP-BOOK. MR. L. S. IPSEN, ARCHITECT, BOSTON.

ST. LOUIS GATE, QUEBEC, CANADA. MR. THOMAS S. SCOTT, CHIEF ARCHITECT TO THE DOMINION GOVERNMENT.

This gate is to be erected on the site of old St. Louis Gate. The style of architecture is adapted to harmonize as far as possible with the existing fortifications. It has a central roadway passage under a segmental arch for general traffic, and a semicircular archway on either side for foot passengers. These roadways and footways form with the fortification wall a continuous promenade. On the front and rear walls are embattled stone parapets corbelled outwards from the face of the walls, and on either end are stone steps leading to the city streets. The stone tower, with pyramidal dormered wooden roof, projects nearly two thirds outwards from the general face of the wall. Opening on the platforms are two corbelled stone turrets of horseshoe plan, one of them being covered with a slate and lead roof.

SOME PROFESSIONAL TRIALS AND TRIBULATIONS.

Architects are often placed in a position nowadays that must bring home to them very forcibly the old story of Columbus and the egg. In the good old times, like other professional men, and like the tradesmen and artisans also, they were members of guilds or corporations whose prestige and high standard of ability were jealously guarded, and each individual had at his back the whole weight of the body to which he belonged. Then no man questioned that an architect knew more of building, or a shoemaker of making shoes, than himself; but *nous avons changé tout cela*, — and now when an architect claims to know more about his profession than does his client, he does so in a rather deprecatory manner, not in the hope of convincing the client, but merely to set himself right with his own conscience.

What architect has not had clients who came to him with a painfully elaborated, impossible sketch, saying, "Now this is about my idea of a house. I wish you would make me a design that would embody it in a practical form." The architect takes such a sketch and remodels it, endeavoring to satisfy all the requirements, and making of it, in the end, a creation entirely his own, which he presents to his client, who exclaims, almost invariably, "Why, how simple! any one could have done that!" and makes up his mind that architecture is a very easy business. Or again, an architect inquires about some work that excites his interest or admiration, as having architectural merit, and is answered, "Well, Mr. So-and-So was our architect, but we really did not need him; my wife was the real designer, and the good points of the house are all her ideas."

Of course it is not pleasant to have one's thunder stolen in such a manner, and the unfortunate architect who has twisted and turned his plans and put one tracing over another, in trying to reconcile the ideas of his client's wife with themselves, with each other, and with his design, is tempted to vow that in future he will reject on principle all ideas brought forward by his client's wife, or any of his female relatives; or, — a more dreadful vengeance still, — that he will let madam design the house herself. It is the only redress he can hope for, as, when such a version of his services is given, it is more generally believed than would seem possible, in view of its improbability, and he has few opportunities to justify himself.

But there are other instances where architects are subjected to more serious wrongs and annoyances, and which are seemingly as difficult of redress. An architect is invited, for instance, together with a number of other architects, to submit designs for some large building; the architect whose design proves the most acceptable to the owner or client is to be appointed architect of the building, and to carry out his design; the other competitors are to be paid a fixed sum, avowedly based, under the most liberal arrangements usually made, upon the amount of time and labor required to produce the drawings. In due time the designs are submitted to the owner, or his representatives, one of them is selected, and its author appointed architect, the other designs being returned to their authors, with the stipulated compensation. So far our architect, whom we will suppose to be one of the unsuccessful competitors, has nothing to complain of, unless, indeed, he has reason to believe that other considerations than the competence of the competitors and the merits of their design were allowed to influence the choice of the owner, a contingency which we will not consider here. The building goes on, and our architect returns to his own affairs, but discovers, during or after the erection of the building, that certain essential features, which at the time of the competition only appeared in his drawings, have been embodied in the new building. Now, what position can he take in the matter; has he a right to feel that he has been defrauded, and if so, who has defrauded him, and what redress can he obtain?

Before entering the competition he was distinctly given to understand that all the competitors entered upon an equal footing; that the unsuccessful ones were to be paid a sum supposed to cover the cost of making the drawings, their designs remaining their own property, to be returned to them immediately after one of them had been selected. It would seem, therefore, that the person or persons who instituted the competition had claimed, and in fact possessed, no right to use the designs they rejected, in any way, and that if they did use them, or any essential part of them, they became morally liable, at least, to the designer for such use. To try to enforce any such claim would be obviously difficult; and it would naturally be, to state the other side of the case, very tantalizing, after having selected from a number of designs the one which had on the whole the best arrangement, not to be able to make use of the many good suggestions embodied in the other designs.

The way out of this unpleasant relation between the owner and the architects, which must result in the long run in injury to both parties, would seem to lie in endeavoring to avoid the possibility of such complications, and that object would be obtained, could it be generally recognized that architects submitting designs in competition were to be paid, not for the cost of getting up the drawing, but for the value to the owner of their interpretation of a given problem. One of the results of such a recognition of the architect's services would be a tendency to reduce the amount of actual labor required to produce the drawings to the minimum consistent with a clear expression of the architect's main idea. The owner, being bound to employ the architect whose design he preferred, would chose only such men as inspired him with confidence in their taste and practical ability; all matters not pertaining to the general idea could therefore be disregarded in making the drawings; in many cases, plans alone, without elevations or perspectives, would amply suffice as a basis upon which to make a choice, so that, without withholding from the owner a fair and just equivalent for his expenditure, the architect could still, with perfect fairness, withhold his ideas upon many questions which he would be called upon to give at a later stage in the progress of the work, and then only in case he was the successful competitor.

One of the contributors to your paper has given, in two articles upon competitions, a number of very excellent suggestions with regard to the general conditions which should govern competitions. There is one point, however, which needs to be especially insisted upon; that is, that the competing architects should be placed in every way upon an equal footing, and bound by the same conditions, especially in the matter of remuneration. Of course, it is the right of every architect to place the value of his services as high or as low as he pleases; but in competitions an agreement should be arrived at between the owner and the architects, and every one should be bound to give his consent to such agreement. If the terms offered are not agreeable to any of the architects invited to compete, they can withdraw, or the owner can make the terms to suit such of them as he is most anxious to have compete. Otherwise, the considerations affecting the choice of a design cease to be considerations regarding only the relative merits of the designs submitted, and cease, therefore, to offer sufficient and proper guaranties to those of the profession who rely for their success upon their professional knowledge and ability.

B. W.

CORRESPONDENCE.

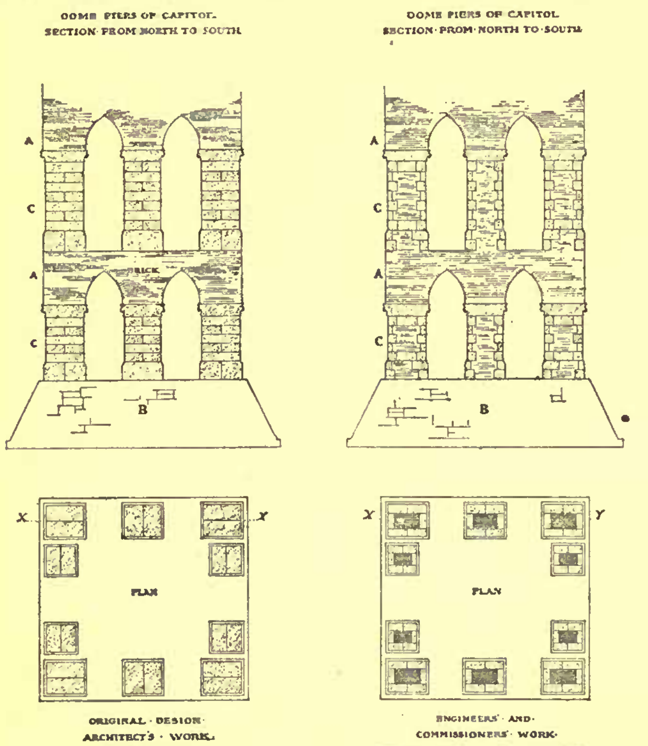
THE DOME PIERS OF THE HARTFORD CAPITOL.

Hartford, Conn., March 15, 1879.

As more than a local interest attaches to the recent investigation regarding the stability of the dome piers at the State Capitol in this city, a short account of the case may prove acceptable to the readers of the *American Architect.* At the annual session of the legislature, in the early part of this year, a committee was appointed to inquire into the construction of the dome piers, which it was alleged were insecure. The duties of this committee were: First, to discover if the dome was safe, and secondly, if it was not safe, upon whom the responsibility of faulty construction rested. It is impossible to give in detail the evidence called forth. Suffice it to say that at the sessions of the committee the opinions of the architect, the engineer, the builder, and others, were given, and the facts as established by the testimony can be summarized as follows: The trouble first arose from the substitution of brick and stone work in the dome piers in the place of the solid granite work shown in the plans prepared by the architect, Mr. R. M. Upjohn, of New York. The substitutions were made in the summer of 1874 by the superintendent, and provided for granite ashlar, with a core of brick, by means of which construction it was claimed the State would be saved an expenditure of $6,000. Without the architect's approval, the substituted plans, having received the sanction both of the consulting engineer, General Franklin, and the capitol commissioners, were placed in the hands of the contractor, Mr. J. G. Batterson, with orders to carry them out to the letter, despite his objection to the substitution of the brick instead of granite. In compliance with the superintendent's orders the granite was cut, and, having passed inspection both at the quarry and at the site, a portion of the blocks were put in place, being laid in cement mortar, according to the architect's specifications, the joints being a full quarter inch. For this latter reason the work was ordered to be taken down after three or four courses had been laid. Upon the refusal of the contractor to fulfil the order, and after a delay of two days, the order was made peremptory, and the work was reset, the joints being reduced to one sixteenth of an inch, and white lime mortar with a small proportion of sand substituted for cement mortar. The contractor remonstrated, but without avail, and during the setting

of the first-story piers hazarded no more advice on the subject. Regarding this point in the case, the commissioners blame the contractor for not making a personal appeal to them, and giving them the benefit of his advice and experience. In reply the contractor claims that by the terms of the contract, which made the decision of the superintendent "final and conclusive," the right of appeal was denied him. He further claims that his objections were made known to the engineer and the commissioners. The commissioners state that no change in plans could have effect without a written order from them; that they gave no written order, therefore the contractor is responsible. To this statement Mr. Batterson replies that the figured plans and drawings given him by the superintendent formed an order in writing, capable of interpretation by any good mechanic, and that it ill becomes the commissioners and the engineer, who not only approved the plans previous to their reception by the contractor, but also witnessed the laying of the stone, and accepted and paid for the same, to say that they issued no written order for the work; that what they did through their agent, they did themselves.

The accompanying illustration shows the two methods of construction of the piers, the solid granite originally designed by the architect, and the brick and granite work afterwards adopted by the engineer and the commissioners and carried into effect. A represents the brick work, and B the brown-stone foundations; C shows the granite.



It will be seen on inspection of the second sectional drawing that at the top of the piers, as well as at the base course, the granite work is built with binders extending across the piers, the intermediate space being filled with courses of brick. At this point an interesting development was made. When the president of the commissioners, acting on the advice of the engineer, sanctioned the change in the pier construction, it was with the understanding that the brick-work would do its part in sustaining the load above, but in the instance just cited this was not the case. It was discovered that the brick-work, in which there are eleven course joints to one in the granite, had settled away, there being a space of half an inch between the upper course of brick and the granite binders at the top of the piers. This demonstrates the fact that the granite shells of the several piers, and not the united strength of granite and brick, support the dome above, whose weight is twelve thousand tons.

An important question touching the workmanship of the granite pier blocks is raised by the commissioners. They claim that the beds of these blocks have "plug-holes," and are cut "slack," thus rendering them unfit for the work. "Plug holes" have been discovered by drilling into the joints for the purpose of introducing molten type metal. This charge is met by Mr. Batterson, who says that the superintendent ordered the grade and quality of the workmanship and that his orders were fulfilled, no complaint being made of any deviation from what was called for; if hammered beds were wanted they should have been ordered at the start.

It is clearly demonstrated that the lime mortar, in which a very small proportion of sand was used, has so shrunk away as to leave little or nothing for the beds. The use of this mortar was, however, in opposition to the advice of the contractor, and was demanded by the engineer and superintendent in charge.

With the execution of the work previous to the time when it was ordered to be taken down, and a change in the setting of the blocks was inaugurated, no fault has been found by the investigating committee, the work having been, in their opinion, thoroughly and properly done, and entirely capable of sustaining the superincumbent weight. And just here two grave errors in the management cannot but make themselves patent: First, injudicious action towards the architect, Mr. Upjohn, causing a change in his plans on the "penny wise and pound foolish" principle; and, secondly, incompetent interference with a competent master-builder. There is no evidence to support the assertion of your correspondent in the columns of the *American Architect* that the work was "scamped."

Arguments both by the commissioners and by Mr. Batterson, the contractor, were made before the special investigating committee in the Supreme Court room at the capitol, on Wednesday of last week. The arguments were thorough and exhaustive, and will have due consideration with the committee before the publication of their report, which at this writing has not made its appearance. While it is to be regretted that any poor constructional work should be found in a building so important as the State Capitol of Connecticut, yet it is conceded that the responsibility cannot be thrust upon the shoulders of the contractor, who was under strict orders, which, in the fulfilment of his duty, he obeyed, and to refuse which might have resulted in his discharge from the work.

The "cripping" of the granite pier blocks was first noticed in the autumn of 1875, when the imperfections were but slight. In 1878 the fractures increased to a greater extent, and upon consultation the most prudent course to pursue was adopted as above referred to: the use of type metal to produce an even bearing. The "cripping" is confined to the first story of granite piers, the work both above and below being sound. This story is fourteen feet and half an inch high. In the second story of the piers, the superintendent, who acknowledged his mistake in the work below, ordered the blocks to be set with quarter-inch joints, in the same manner as the work was originally begun by the contractor.

Touching the stability of the dome itself, it has been pronounced by the architect without settlement, and entirely safe. This statement is doubtless a boon to Connecticut people generally, after the harassing questions which have of late arisen. Chetwood.

ABSORPTION-DRAINS *versus* CESSPOOLS.

I have been much interested in the description given on page 85 (No. 168), under the caption The Plumbing in a First-Class Boston House, of an attempt to carry out Moule's system of subsoil irrigation as described by me in the *Atlantic Monthly*. The trial was, on the whole, a fair one, and the result was quite as satisfactory as I should have predicted, probably quite as satisfactory as its projector hoped for, — much more satisfactory, all things considered, than any cesspool system could be. At the same time, the arrangements were not altogether what they should have been, even after the described improvements had been made.

I have now applied this system in so many different situations and under such various circumstances, that I am able to prescribe the proper conditions more accurately than I could do when the *Atlantic* articles were written (1874). Some of these conditions were indicated in the instance recited by Mr. Clark. (1.) I believe it to be essential, whether the soil-pipe waste enters the drain or not, that the tight catch-basin be used; because even the flush-tank, under the rapid agitation of its discharge, will send out lumps of grease, etc., which ought to be sparingly admitted to the absorption drains. (2.) The catch-basin should receive the discharge of the flush-tank, in such a way as to cause the least possible disturbance of its floating scum or its sediment, — the best plan being, probably, to discharge the inlet-pipe exactly at the water level. The catch-basin should be about three feet deep below the water line, and its point of discharge should be ten or twelve inches below the water line. (3.) From the outlet of the catch-basin to the end of each absorption drain, the fall, which need not be more than two inches per hundred feet, must be absolutely continuous, so that a clean flow shall be provided at every point. Even the branches of the main drain should open from its bottom; this may be secured by turning the branches downwards until the point of junction between their invert and the invert of the main becomes the lowest point of the channel of the main. In the Lenox absorption field the branches open out from the bottom of the main and turn with quarter bends to the horizontal position. Boynton is now making branch pieces for this work in which the branches start at the level of the invert. (4.) The most important condition of all is, in my belief, the placing of the absorption drains very near to the surface of the ground. I have now had nine winters' experience with this system, — in one case north of Boston. My own drains lie from ten to twelve inches below the surface of the ground, and the earth in which they are placed has been frozen to a depth of three and a half feet. I have never heard of a case where frost has interfered in any way with the operation of the system. I am convinced that the question of frost may be entirely disregarded, — at least at a depth of ten inches. The nearer the surface, the more effective is the action of vegetation and of atmospheric oxidation. I regard ten inches as the *maximum* depth, and I shall not be surprised if future experience reduces it to six inches. The starting of the drains at a depth of sixteen to eighteen inches, in the case described, was, in my opinion, a defect. It is necessary to place the cemented pipe at — or near — this depth, but, if possible, the open-jointed drains should come nearer to the surface as soon as possible.

It is a good plan to close the outer ends of the absorption drains,

and thus to compel the liquid to escape at the joints. Where the flush tank is used it is well to have the drains gorged for a moment, to make sure that there is a tolerably even exudation throughout the system. It is not easy to make good work on an earth foundation, — especially where the ground has recently been brought to a new grade after building, and such shallow ditches are apt in any case to be dug too deep in places and to require filling. It has been my practice to lay the tiles on strips of board, but C. W. Boynton, of Woodbridge, N. J., is now making tiles especially for this purpose which simplify the process very much. They are "round tiles" lying in a continuous trough of larger half-rounds (breaking joints). The laying of stones beside the tiles, as described by Mr. Clark, is not necessary, — nor is it an improvement, for the stones will soon become imbedded in earth, with no open interstices, and will take the place of just so much absorbent material.

I have found the drains to work as well at intervals of four feet as at wider distances, and in case of need I should not hesitate to place them two feet apart.

The case described was — as compared with what we are accustomed to — a decided success. If all the foregoing conditions had been complied with it would have been a complete and permanent success. GEO. E. WARING, JR.

THE EDDYSTONE LIGHTHOUSE AND THE TOUR DE CORDUAN.

THAT a structure which was so wholly original, and which was erected under such disadvantageous circumstances as naturally attended on the exposed site, should have resisted the storms of the Atlantic as long and as well as has been the case with this noble work, must always be considered as incontrovertible evidence of the genius of Smeaton. In course of time the tremor of the building, wi h each wave stroke from the westward, more especially during a storm from the west-south-west, has become more and more alarming. The joints of the masonry have yielded to the heavy strains thrown on them, and the sea-water has been driven through them into the interior of the building. The upper part of the structure, according to a report from Mr. James Nicholas Douglass, the worthy successor of Mr. Robert Stevenson as our chief living authority on lighthouses, has been strengthened on two occasions, viz., in 1839, and again in 1865, with strong internal wrought-iron ties, extending from the lantern floor downwards to the solid portion of the tower. On the last occasion it was found that the chief mischief was caused by the upward stroke of the heavy seas acting on the projecting cornice under the lantern gallery, which lifted the portion of the building above this level. After reducing the projection of the cornice about 5 inches, and well fastening the stones together with through bolts, no further leakage has occurred at this point. The tower is now in a fair state of efficiency, but the gneiss rock on which it stands, as anticipated by Mr. Stevenson, has been seriously shaken by the incessant sea strokes on the tower; and the rock is considerably undermined at its base. It has, therefore, been determined to erect a new tower on a spot which affords a good foundation, near low-water level, about 127 feet distant from the present site. The focal plane of the present lighthouse is at an elevation of 72 feet above high water. That of the new building will be 130 feet. The actual, useful range of the light, which is now about fourteen nautical miles, will thus be extended to seventeen miles and a half. On the completion of the new tower, it is intended to take down the present lighthouse to the level of the top of the solid work, 29 feet above high water at spring tides.

The new tower will be constructed entirely of granite. It will have a cylindrical base, 44 feet in diameter and 22 feet high, rising to 2 feet 6 inches above high-water springs. From this base will spring the shaft of the tower, the section of which will be a concave elliptic frustum, the generating curve of which has a major axis of 346 feet, and a minor axis of 74 feet. The diameter at the base will be 35 feet 6 inches, leaving around it a margin of 4 feet 3 inches as a landing platform. The height will be 138 feet above the rock to the top of the cornice, and the diameter of the tower, under the cornice, will be 18 feet 6 inches. The tower will be solid (with the exception of containing a water-tank) to the height of 25 feet 6 inches above high-water springs. At this level will commence the side-walls, with a thickness of 8 feet 6 inches, diminishing to 2 feet 3 inches at top. The tower will contain nine apartments, each 10 feet in height, in addition to the lantern, the uppermost seven being 14 feet in diameter. The whole of the work will be dovetailed and cemented, both horizontally and vertically, according to the system introduced by Mr. Stevenson, and adopted at the Hanois, Wolf, and Longships Rock lighthouses. The total cubic contents of the granite masonry will be about 69,000 cubic feet, and the estimated cost is £78,000.

The most magnificent lighthouse of modern times is the Tour de Corduan. It is built on a rock at the mouth of the river Garonne, on which river, at a distance of seventy miles from its mouth, stands the important commercial city and port of Bordeaux. The tower was commenced in 1584, under the reign of King Henri II., and was completed in 1610, in the reign of King Henri IV. The architect was Louis de Foix.

The island rock on which this great Pharos is built is exposed only at low water, when an area of 3000 feet of rock in length, by half that dimension in width, is left dry by the tides of the Bay of Biscay. On this rocky area is provided a cylindrical base, 135 feet in diameter, which is built solid up to 10 feet above high-water mark, with the exception of a cistern in the middle, and an opening for the stairs, which rise from the high water level. This opening is closed by heavy doors, and is reached by a ladder from the rock below, when the tide permits. The sides of this circular base have a batter of 5 feet; and around the platform of 125 feet diameter, thus arrived at, a wall is carried, 12 feet thick at its base, and 12 feet high.

On the centre of this circular area is erected the tower, which is 50 feet in diameter at its base, and consists of successively diminishing stories. The lower story is Doric; the second and third, Ionic; the fourth, Corinthian; the fifth, Composite. The interior was handsomely decorated and furnished; the apartments of the first and second stories being fitted for storerooms and for domestic use. The third story formed a chapel, 31 feet in diameter, and having a dome 40 feet high. Over this rose the Corinthian cupola, 21 feet in diameter, to the height of 27 feet. It had a stone balustrade around, and supported the lantern, which formed the summit, and which was 9 feet in external diameter, 5 feet within, and 17 feet high. The total height of this Pharos is 182 feet 6 inches.

When the tower was first built the light used was that of blazing wood, which was burned on a cresset in the lantern. Coal was afterwards substituted. The smoke rose through an opening of 18 inches diameter in the dome of the lantern, passed into a finial chamber above, and escaped by side openings.

In 1727 the lantern was destroyed, and an iron one substituted by M. Betri. In 1780 the catoptric system of illumination was introduced by Borda, and an Argand burner was placed in the form of a parabolic reflector of silvered copper. In 1810 the dioptric system of Fresnel replaced the catoptric method. The Argand lamp now used in this and in other French lighthouses contains four concentric circular wicks, which are supplied by pumps with a constantly overflowing supply of oil.

One reason for the ornate character of this lighthouse is said to be that it was designed as a part of the projected chain of water communication to connect the Atlantic with the Mediterranean. This is actually effected, on a minor scale, by the canal of Languedoc, which is 150 miles long, and connects the Garonne with the Mediterranean. — *The Builder.*

TIN-LINED PIPE.

BOSTON, March 21, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — I am informed by a prominent dealer in lead pipe, that there is now, and for a year or more past, no tin-lined lead pipe made and to be found in our markets having more than five per cent of tin in its lining. The consequence is, that the tin being applied to the lead while the latter is heated makes an alloy with it, and the pipe is therefore lined with a film of solder, which corrodes quickly, more quickly than lead alone, from the supposed galvanic action which always takes place when two metals joined together are exposed to the same fluid. I have seen pieces of this so-called tin-lined pipe, which have been in use only a year, riddled on the inside with holes, and looking like a small-pox subject. When tin-lined pipe was first introduced here, it contained some twenty-five per cent of tin. But the "improved processes" have reduced the lining till it has become worse than none, and its use for conveyance of drinking water should therefore be carefully avoided, unless it contains at least one fourth its weight in tin. EDWARD S. PHILBRICK.

A GENERAL EXHIBITION OF CONTEMPORARY ART.

Boston Chapter of the American Institute of Architects, 1879.

THIS Society announces with pleasure that it has united with the Boston Art Club and the School of Drawing and Painting in the proposition to hold a general exhibition of contemporary art in the second story of the new wing of the Boston Museum of Fine Arts, which the trustees of the Museum have kindly placed at our disposal for this purpose.

The completion and opening of this extensive addition to the Museum building is an important event in the history of art in this city, and it seems desirable that, in the proposed exhibition, the interests of architecture should be represented by the side of those of painting and sculpture in a manner to reflect credit upon the profession, and to justify the increasing interest of the public in our art.

The aid and coöperation of the profession generally is earnestly solicited in this undertaking.

The exhibition will open on Tuesday, April 22, and will close on Saturday, May 24, during which period no work mentioned in the catalogue can be withdrawn from the galleries.

Contributions intended for this exhibition may be sent to the Museum of Fine Arts until Saturday, April 12, after which date no works will be received.

Drawings within the city limits will be collected and returned through the agency of Messrs. Williams & Everett, free of charge to contributors. Charges for transportation, both ways, of contributions to the exhibition will be paid by the Museum of Fine Arts. No pecuniary liability for drawings in transit is assumed by the manage-

ment, but insurance in transit will be effected to the extent desired by the owners, without cost to them, upon their written request. As the Museum building is fire proof it is deemed unnecessary to insure during the exhibition, and efficient means will be taken to guard and protect the property entrusted to the management, and to insure its safe return to the owners.

The annexed schedule should in all cases be carefully filled out and signed by the exhibitor in accordance with the printed directions thereon, and sent by mail to the Secretary of the Boston Society of Architects on or before Monday, April 7.

All architectural drawings will be submitted to a committee of the Society, who will vote upon each drawing separately and decide upon its acceptance or rejection.

Part of the space assigned being furnished with glazed upright cases, a certain proportion of unglazed and uncovered drawings may be sent, but glazed drawings are preferred.

E. C. CABOT, *President.*
HENRY VAN BRUNT, *Secretary.*

BOSTON, 2 Pemberton Square, March 25, 1879.

NOTES OF EXPERIENCE AND INEXPERIENCE.

16. TERNE PLATE.—Terne plates are made of sheet iron covered with lead, in distinction from the bright tin plates, in which the covering is of metallic tin. The tin undoubtedly forms the best and most durable coating, but it is so expensive that the manufacturers reduce the thickness to the utmost, in their competition with each other, and the consequence is that on plates of average quality it forms a mere film at the upper part of the plate; so that the terne plates where the coating, though of inferior metal, is thicker, are perhaps preferable, at least for roofing purposes. C.

17. COW-DUNG IN MORTAR.—As a subscriber and careful reader of your valuable magazine, I have been much interested in your recent articles on chimneys and fireplaces. I have for some time had in mind, however, to write and ask for the reason for a receipt given in your issue for November 23, 1878, in an article headed, "Hints on Building Chimneys," section 5. Please have your practical chemistry man give in your next number the reason *why* a chimney should be "pargetted" with a mortar made of such proportions as there given, namely, "one part fresh cow-dung and three parts ordinary mortar." It is a specification that would make brick layers growl not a little at being compelled to carry out, unless a good reason could be given for it, and this for my own satisfaction at least, if not for theirs, I trust you will give. I am one of those who believe that the way to gain desired information, on just such points as this, is to ask of the practical workman, as well as the chemist, "Why?" SUBSCRIBER.

NOTES AND CLIPPINGS.

ERRATUM.—In the last paragraph of the article Recent Pictures in New York, printed in our last issue, the writer was made to speak of the artists represented in the Knœdler collection as "sentimental" artists, whereas "continental" was the adjective used.

SPONTANEOUS COMBUSTION.—There was an interesting discussion on this subject at a recent meeting of the French *Académie des Sciences.* M. Cosson described an accident which had occurred in his laboratory a few days before. While the narrator was working in the laboratory, a portion of the boarding of the floor spontaneously took fire. The boards were in the vicinity of an air-hole, fed with warm air from a stove four metres away on the floor below. A similar accident took place two years ago, and in consequence M. Cosson had the boards adjoining the air-hole replaced by a slab of marble. The boards which now ignited adjoined the marble. The heat to which the boards were subjected was, however, very moderate, being only that of warm air at 25° C. Nevertheless, M. Cosson said the wood had undoubtedly been slowly carbonized. Being thus rendered extremely porous, a rapid absorption of the oxygen of the atmosphere had resulted, and sufficient caloric was thereupon produced to originate combustion. The danger thus disclosed, said M. Cosson, is one to which the attention of builders ought to be directed. In the instance in question, M. Cosson was able to extinguish the fire with a little water, as he was present and witnessed its beginning; but had it occurred at night, during his absence, it would undoubtedly have completed its work of destruction. M. Faye stated that at Passy, a few days before, a similar case of spontaneous fire, due to the action of the warmth from the air-hole of a stove upon the wood-work, had occurred at the house of one of his friends.—*Manchester (Eng.) Cotton.*

TENEMENT-HOUSES IN BOSTON.—The examination of 2,700 tenement-houses in the city of Boston, which has just been completed, shows that nine tenths of them are in fair order so far as the requirements of the law are concerned. Improvements have been ordered in those which are found to be faulty in construction or arrangement.

A NICKEL MINE IN MASSACHUSETTS.—At Dracut, three miles from Lowell, a cave which was thought to be of nature's make has proved to be a mine shaft, eight feet in diameter and some forty feet deep, which is supposed to have been driven nearly two centuries ago by the early settlers, who mistook for indications of silver the indications of nickel, which is the metal actually found. A company has been formed to work the mine, which promises to develop satisfactorily.

COMPRESSED AIR IN BLASTING.—Mr. W. E. Garforth, of Dukinfield, has exhibited before the Manchester (Eng.) Geological Society an arrangement for using compressed air in blasting, at a pressure of eight thousand pounds and more per square inch.

TOWN HEATING BY STEAM.—Baltimore is the last city that has made a movement toward adopting the Holly system of town heating by steam.

TREE PLANTING IN MASSACHUSETTS.—By the following circular, attention is drawn to the necessity of restocking our wood and forest lands,—a necessity which will before many years be as apparent in Maine and Michigan as it already is in Massachusetts.

OFFICE MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE,
5 PEMBERTON SQUARE, BOSTON, March, 1879.

The attention of Massachusetts land-owners is called to the following State law, passed by the legislature of 1878, and entitled "An Act concerning Plantations of Timber Trees and the Tax thereon:"—

"All plantations of timber trees in this Commonwealth, upon land (not at the time of said planting woodland or sprout land, and not having been such within five years previously), the actual value of which, at the time of planting, does not exceed fifteen dollars per acre, of any of the following kinds, to wit: chestnut, hickory, white ash, white oak, sugar maple, European larch, and white pine, in number not less than two thousand trees to the acre, shall, together with the land upon which the same are situated, be exempt from taxation for a period of ten years from and after said trees shall have grown in height four feet on the average, subsequently to such planting: provided that said exemption shall not extend beyond such time as said land shall be devoted exclusively to the growth of said trees; and provided, further, that the owner or owners of such plantations shall appear before the Board of the Assessors in the towns where the same are located and prove to the satisfaction of such Board the herein-mentioned conditions.

"SECT. 2. This act shall take effect upon its passage.

"Approved April 9, 1878."

THOMAS MOTLEY, *President.*
EDWARD N. PERKINS, *Secretary.*

JAPANESE BRONZES.—Mr. Consul Flowers, in a report on the commerce of Hiogo and Osaka, Japan, lately issued by the Foreign Office, thus speaks of the manufacture of Japanese bronzes: "The moulds, which of course vary according to the shape of the vase or bowl it is desired to make, are made of wood, sometimes covered with straw. On this a coating of clay is placed; over this comes a layer of wax, which is moulded into the design required. Another thick coating of clay is then added, and the inner wooden mould being taken out the orifice at each end is closed. Two holes are then made at one end connecting with the layer of wax, so as to enable the wax, when melted, to run out, and through these the molten bronze enters, filling the interstices occupied by the wax. The subsequent process of casting is of the rudest kind. The earthen mould is placed in a small clay oven hollowed out in the floor of the workshop, the size of which depends upon that of the casting. The oven is then filled with charcoal and closed, with the exception of a circular opening at the top, on which a chimney, a foot or so high, is built of wet clay. The oven is connected underground with a wooden bellows, protected from the sparks and heat from the furnace by a small earthen or stone wall a foot high, and which is worked by hands and feet. The first operation is to melt the wax, which runs out, leaving the impression of the design stamped firmly in the surrounding layer of clay. This done, the mould is taken out and allowed to cool. It is then put a second time into the furnace, as before, and the molten bronze is then poured into the mould through the holes by which the wax escaped. After the bronze has filled the mould the chimney is knocked off, the oven supplied with fresh charcoal laid evenly around the mould, and a lid being put on the oven, furnished with small perforated holes, the bellows are set to work again for an hour or more, according to the size of the casting taken. This operation generally occupies a day. When the casting is taken out of the oven, the earth outside and inside is scraped off, and reveals the vase or bowl in a rough state. It is then put into the hands of rough workmen, boys being mostly employed in this part of the work, by whom it is polished and scraped with a knife until it presents a smooth surface. It then passes on to the carver, who fills in the details of the designs. When his work is done the vase or bowl is dipped into a boiling solution of vinegar, sedge, and sulphate of copper, in order to give it the proper color. A few finishing touches in the way of polish are added, and the article is finished and ready for sale."

WERE THE MOUND-BUILDERS CANNIBALS?—The New York *Times* says that a mound similar to those so common in our Western States was recently found and opened in Japan, and scientific examination of its contents affords ground for a very strong argument that cannibalism was practised, perhaps habitually, by some of the ancient inhabitants of that country. That the Omori mound was not a tomb was sufficiently shown by the fact that the skeletons found in it were never complete, and that the bones lay about in disorder, and in no relation to each other, whereas the bones of buried bodies would be found approximately in some position possible in life. Moreover, the human bones were found among those of other animals, and, like them, were broken into lengths convenient for cooking and eating, and were deeply scratched in those portions, such as the joints, from which the eater would find most difficulty in removing the flesh. The discovery is a curious one, as it is the first indication of cannibalism among a people whose characteristics as at present known do not suggest the practice by them of such a custom. But similar evidence has been held by archæologists sufficient to prove the former existence of cannibals in North America.

THE CAUSE OF AVALANCHES.—It is very well known to those who have travelled in the Alps, that the inhabitants believe that avalanches rarely fall when the sky is overcast, but that they frequently do so when the sky grows clear. In winter the monks of St. Bernard always urge travellers not to leave the monastery when the sky is clearing, and many times those who have neglected that advice have fallen victims to their imprudence. M. Dufour, in a paper read before the Paris Academy of Sciences, endeavors to explain the phenomenon by reference to the contraction and decrease of strength of snow and ice under decrease of temperature. "In cold weather," he says, "when the sky clears off the temperature falls, especially just before sunrise, and then the filaments of ice which retain the snow on the slopes of the mountains contract and snap, the mass begins to slide, and draws others in its train; for the slightest cause of movement, a shout or the smallest shock, may cause the fall of enormous avalanches." A circumstance of which M. Dufour was a witness confirmed him in his views. A meadow of several acres in extent had been prepared at Morges for skaters by covering it with water, which froze while the heavens were covered. One night the sky cleared off, and M. Dufour noticed a sensible fall in the thermometer. Immediately afterwards he heard crackings in all directions, due to the contraction of the ice from the increased cold, and numerous splits were observable. That phenomenon is precisely analogous to what occurs when the heavens clear up and cause the fall of avalanches.—*Van Nostrand's Engineering Magazine.*

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, APRIL 5, 1879.

CONTENTS.

THE most important incident, aside from matters of national politics, which occurred last week was the rendering by the Court of Appeals of a decision that a writ of peremptory mandamus shall issue against Comptroller Kelly, of New York, compelling him to pay to the trustees of the Brooklyn Bridge the million dollars which are due from the city of New York for the year 1878. It still remains uncertain whether the legislative committee, which has just concluded its investigations in New York, will find reasons for, or means of, preventing the completion of the bridge; but the opinion of the Court of Appeals, written by Judge Earle, makes improbable any such action on the part of the legislature, for it declares that so long as no departure is made from the plans accepted by the legislature in the act of 1875, and approved by Congress, it is bootless to inquire whether the bridge will interfere with the free and common navigation of the river; because "what is thus sanctioned by state and national legislatures cannot be a nuisance, or otherwise unlawful." The action of the comptroller in withholding payment of the money demanded by the trustees, because he considered that they were extravagant in its disbursement, and because he believed that the bridge when completed would be useless and unsafe, is censured as being as unjustifiable as it is novel. It thus appears that Mr. Kelly, who has acted throughout in opposition to the advice of Corporation Counsel Whitney, his lawful adviser, has gained nothing by his obstructiveness except a judicial rebuke; while he has added to the burden of the tax-payers the costs of three lawsuits, and the interest on the sum which is declared to be due the trustees, — interest which, it is said, runs at the rate of two thousand dollars (?) a day. Add to this the six months' interruption to the work, which delays by just so much the time when the bridge can begin to recoup its builders, and it will be seen that New York has small reason to applaud its comptroller.

THE really important point in Mr. Kelly's defense, namely, the improbability that the bridge can be completed at a cost within the eight million dollars which the legislature has consented shall be spent upon it, the opinion says, does not support him in any way in his refusal to supply the money. The bridge, which was begun by a private corporation in 1867, under authorization of an act of legislature, was permitted to become by purchase, in accordance with the act of 1875, a public undertaking, upon whose prosecution the act authorized the expenditure of eight million dollars, of which amount Brooklyn was to pay the yearly quota of two millions, while New York paid one million. So long as they did not depart from the plans which were accepted by the legislature, the trustees were acting within their right in exacting from both cities the payment of the sums mentioned, even though it were certain that the expenditure of the eight millions could not complete the bridge. The naming of this sum must not be taken as fixing a limit of cost within which the bridge must be finished, or forever left unfinished; it was merely the sum which the cities were authorized to expend under that act. It was perfectly competent to the legislature to authorize the two cities to expend other millions, or even to complete the bridge with money drawn from the State's coffers. It was impossible to calculate the exact cost of an undertaking of such magnitude and unusual character, which must continue through many years, and therefore it would be unjust to assume that the legislature had undertaken to fix the ultimate limit at eight millions; while it would be equally unjust to pretend that it was not the intention of the legislature that the bridge should be finished. From this opinion three of the seven judges dissented, and in an opinion written by Judge Folger declared that the act of 1875 limits the total cost to eight millions. Until this limit is reached, however, it seems little likely that there will be any further delay on the part of either city in furnishing its allotted contribution.

ANOTHER interesting lawsuit has been decided recently, which we have mentioned from time to time; not because it was connected with architecture in even the remotest degree, but because it was of general interest, in that it was likely to show how great weight was to be accorded the unquestionable rights of the individual, when opposed to the interests of the most important industry in a great State. In spite of the certainty that such a decision will cause an immense depreciation in the taxable value of certain property in California, a decision has been rendered in what is known as the Mining Débris Case to the effect that hydraulic mining cannot be legally pursued, unless the property of landholders along the stream used for washing can be protected from overflow and damage. In the special instance which was made the test case, it was to be decided whether certain hydraulic mining companies had a right to destroy ultimately forty thousand acres of arable land in the valley of the Bear River, by continuing to discharge into it the tailings of their washings, the effect of which had been already to choke up the natural bed of the river, and to cause it to seek new channels here and there through the valley; in doing which it had overflowed certain lands seventy miles distant from the mines, and had covered them with slickens, sand, mud, and grit to a depth varying from three inches to fifteen feet. This decision will practically put a stop to hydraulic mining, at least as at present conducted.

IT would have been reasonable to hope that the "defective flue" had done all the havoc it could do during the early winter, and that at this season of the year we should not be called on to speak of so distressing a disaster as the burning of the Tremont House at Claremont, N. H., where five persons were burned to death in the middle of the night, while others received serious injury. The burning of this four-story wooden building of moderate size suggests sufficient food for thought. It shows that relief from a large proportion of such disasters must be sought, not through building laws, for they can be enforced only in cities, but by educating the mechanics, who, unadvised by architects, build the greater part of the buildings in which the inhabitants of this country are housed, to an appreciation of the fact that there are in the construction of almost every building times when the rule of thumb cannot be followed safely. It also suggests how much greater would have been the loss of life if the building, instead of a country tavern, had been one of the immense hotels of our cities, with its tortuous and unlighted passages, and its many stories served by two, or, at most, three staircases, of whose topographical relation to their rooms the guests are generally ignorant, because of their habit of ascending and descending by the elevators.

IT is regrettable that the mayor of Brooklyn did not see fit to veto at once, on its own demerits, the action of the aldermen in voting to light the streets of that city with naphtha, rather than to assume the very undignified position of one who delays to use the veto in order that the gas companies, competitors of the Automatic Gas Lamp and Lighting Company, may be induced to modify their bids. Whatever the motives which actuated the mayor, the city has probably escaped a great peril, for of all the hydrocarbons naphtha is one of the most unstable, unless properly distilled and clarified. So dangerous is it that one of the large insurance companies in New England, a company which has risks on forty millions' worth of property, although its losses last year were less than a thousand dollars, a fact which indicates a prosperity which would almost justify it in accepting some dangerous risks, does not allow a particle of naphtha to be used

in any of the buildings it insures. In the Brooklyn case the naphtha was not to be distilled and distributed to the lamps through gas-pipes, as might be supposed, but each lamp-post was to have its own reservoir of fluid and distil the gas as it was required, — a system which is adopted in country towns, where the occasional explosion and extinguishment of a lamp does no great damage, but which would be extremely dangerous in a large city.

The editors of that admirable *journal de luxe*, *L'Art*, have instituted lately a new department in their journal entitled "Vandalism," of which they say, "Under this head we will stigmatize henceforth, pitilessly and without truce, all acts of barbarism in matters of art which may be brought to our notice, even though in so doing we should attack our own friends." The first instance of vandalism that is thus publicly arraigned is the action of the Dutch Government, in threatening to abolish the commission which, only some four years ago, was appointed to the charge of the artistic and historical monuments still remaining to the kingdom; remains which, uncared for and unprotected as they too often are, still make Holland one of the countries which the artist, be he painter, sculptor, architect, or cultivated amateur, most delights to visit. Whether the necessities of their graceless king, or the careless ignorance of the value of works of art which is to be expected of any ordinary body of legislators, is the cause of this retrograde step, so much at variance with the movement of the day in all other civilized countries or not, it is one which is too likely to bring about a return to those times when it was possible for individuals and bodies corporate to traffic without let or hindrance in their rich inheritance. Thus in 1871 it was possible for the directors of the South Kensington Museum to acquire for forty-five hundred dollars the marble rood-loft, the work of Conrad van Noremborgh, of Namur, which was one of the noticeable features of the church of St. John at Bois-le-Duc, in North Brabant. To be sure, the church, built in 1419–1497, is spoken of as one of the most perfect of Dutch mediæval churches (see *American Architect* for May 6, 1876), while the rood-loft bears the date 1625, and is pronounced Renaissance in style; so that in the absence of information on this point we may assume that it was removed in order to be replaced by one more in keeping with the style of the church itself. Still this does not excuse the sale to a foreign country of a work of much artistic merit. It may be remembered that a similar sale at Brescia, in Italy, recently caused the Minister of Public Instruction to issue an order that no more such sales should be made without authority.

The second instance mentioned by *L'Art* concerns the Royal Museum of Antiquities, Armor, and Artillery, which is housed in the only one of the gates of the city of Brussels which was left standing at the time when the ancient ramparts gave place to boulevards, after the prevailing fashion in European walled towns. This gate, La Porte de Hal, in form a donjon-keep, has, by the way, considerable architectural merit. As director of this museum M. Théodore Juste, member of the Royal Academy of Belgium, was installed not long ago, not because he was the man best fitted for the place, but because he had proved himself a very uncomfortable member of one of the ministries, and his colleagues thought that this was a good chance to get rid of him. "M. Juste," says *L'Art*, "has compiled several books of history, bulky books, which do not imply, however, that he is a historian." This passion for book-making seems to be likely to prove his ruin, for he has lately issued the fourth edition of a partial catalogue of the collections in the museum, of which catalogue the commission which has the supervision of the museum has asserted that it contains "almost as many errors as words." Against the outrage of continuing in office a man at once so ignorant as to make, and so obstinate as to refuse to correct, the grossest errors, the commission, which is composed of men of high rank and of undoubted archæological acquirements, has appealed unavailingly to the ministry which appointed M. Juste; for the only reply that was vouchsafed was that the fault lay with the commission for allowing the original publication of the catalogue. Thus supported, M. Juste still remains in power, and in wilful ignorance. It is unquestionably worth while to draw attention to such mistakes as these, though, acts of vandalism as they are, one need not go outside of Paris to find doings as objectionable, for it must remain a lasting subject for regret that the charms of old Paris, which have been immortalized in the etchings of Méryon, are so rapidly disappearing in all directions before the successors of Baron Haussmann.

Just at this juncture American architects who can afford to add a valuable work to their libraries can render a real service to the profession at large by subscribing to the dictionary which has been publishing in London under the auspices of the Architectural Publication Association for a series of years. What is the history of the undertaking, who were its originators, we do not know. The publication of the dictionary advanced satisfactorily for a number of years, the different parts in which it was issued appearing with sufficient regularity to satisfy those who had subscribed to it, until it reached the letter M, when the funds had become so diminished that it was thought best to abandon publication until they could accumulate by gathering interest, and be increased by new subscriptions. In 1874, thanks to this prudent policy, the association was able to resume its labors, and during the last year a part was issued which covers the letters M, N, O. This renewed activity met its reward in the new subscribers who were attracted, so that the amount that the association has in hand is only some six hundred dollars less than it was in 1874, and the association hence is enabled to proceed with the preparation of the letter P, the work being conducted under the charge of Mr. Wyatt Papworth, with whose revision of Gwilt's Encyclopædia of Architecture most of the profession in this country must be familiar. The dictionary, which is well worth having, is a royal quarto in form, illustrated by wood-cuts in the text and by lithographic plates, which are sometimes devoted to single subjects, at others exhibit groups of illustrations which have no connection one with the other save that their initial letters are the same. As to these lithographic plates, we trust that the management will see the wisdom of adopting, instead of the true lithographic method hitherto followed, some of the modern processes of photo-lithographic reproduction, even at the cost of sacrificing uniformity of style. The association appeals for subscriptions, £21 for the parts already issued, and for contributions to the text. As it will doubtless be glad to obtain American subscribers, we venture to think that it will not be unwilling to receive literary contributions from American architects, should any one be moved to offer anything on topics which can be treated in the remaining portions of the work. There must be many terms, materials, processes, and utensils peculiar to American usage, which ought properly to find a place in a work which for many years must remain the most important architectural dictionary in the English language.

The receipt within a short time of several anonymous though unobjectionable communications seems to show that the rule, that all communications, however trifling, must be signed with the name and address of the writer, as a guaranty of good faith, universally observed by all editors who strive to keep the purity of their columns above reproach, cannot be repeated too often. In no department of our paper is the enforcement of this rule so necessary as in the department of Notes of Experience and Inexperience, where the temptations and opportunities for the practice of what we trust we may without offence style "business subterfuges" are exceptional. Oftentimes the answer to a question will be to the direct pecuniary advantage of some dealer or manufacturer, but provided we are assured of the good faith of the questioner we shall be ever ready to give the answer. As to answers which may be to the disadvantage of any one, we will strive to use all due discretion and judicial consideration.

PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS, HELD NOVEMBER 13, 1878.

EVENING SESSION.

The Convention met at 8 P. M., and was called to order by the President.

Before proceeding to the reading and discussion of papers, which was indicated on the programme as the business of the evening, it was voted that the chair appoint a nominating committee, in order that they might have time to consult before the opening of the morning session on the following day, which was the time appointed for election of officers.

The first paper read was on The Plumbing in a First-Class Boston House, with an Account of some Sanitary Experiments, by Mr. Clark, of Boston. (See *American Architect* for March 8 and 15, 1879.)

Mr. Stone mentioned that he had found difficulty in using brass pipes for cold water under the street pressure, which in the lower parts of the city of Providence amounted to 70 pounds per inch, and had seen the pipes split for some distance, doing serious damage.

In answer to a question how the brass pipes were kept from tar-

nishing, MR. CLARK said that the practice was to polish them and give them a coat of shellac varnish.

MR. POST said he had used brass pipe in the plumbing of a hospital, supplied from tanks in the top of the building, and they had done very well. There was no trouble in keeping them tight.

The next subject on the programme was The Prevailing Faults of our Architectural Designs. The president called upon Mr. Cady for papers. MR. CADY read letters on the subject from Mr. Cummings, of Boston. The third subject was The Use and Abuse of Brick in Decoration. MR. LITTELL read a paper.

No other papers being presented, the committees were announced as follows: —

Auditors, Messrs. Murdock, Stone, and Bloor.

Nominating Committee, Messrs. Post, Longfellow, and Robertson.

Mr. Post declining to serve, Mr. Stone was substituted on the nominating committee.

Letters were read from Mr. Leonard F. Beckwith, president of the Fire-proof Building Company, of New York, Corresponding Member of the Institute, and from Merchant & Co., 53 Broadway.

MR. STONE, referring to the passage in the paper last read which spoke of the smallness of the pieces of terra-cotta as a reason why stone was preferable, said that he had lately used terra-cotta in large pieces for window-caps, and in other places, and found the work, in some cases six or seven feet long, well and uniformly burnt, straight and free from distortion, and of great strength. He could not see why burnt clay should not replace stone, especially in fire-proof construction, for which it was particularly adapted. Where used in connection with brick, either perfect similarity or striking contrast of color could be obtained at pleasure, and it would seem that the modelling of the clay by the artist's hand before burning was as artistic and effective a process as the laborious carving of stone. He thought that the recent fashion of carving brickwork, after laying in the wall, was a step in the wrong direction, and that it was more logical to model the clay in its plastic state, before burning, into the forms required.

MR. LITTELL agreed with Mr. Stone in regard to the carving of brickwork after laying. As to terra-cotta, he had not himself seen any which was so agreeable to his eye in texture or color as stone. As in sculpture a plaster cast was less pleasing than the marble original, although the form was the same, so with terra-cotta, which resembled plaster in some ways, as compared with stone in architecture. Another point was that to the eye, at least, the impression given by terra-cotta was that of weakness in comparison with stone, and he thought it necessary that a material should not only be strong, but look so.

MR. POST remarked that the durability of terra-cotta was shown by its remaining intact in the Roman walls after the walls themselves had crumbled away several inches. He thought part of the bad effect which the use of brick had sometimes on the design was due to the inability of the designer to master his material. There was no inherent reason why a design executed in terra-cotta should not be as effective, and it would certainly be as durable, as one carried out in stone, — much more so than one in sandstone. He had always brought himself with reluctance to the execution of an important building, which ought to last for ages, in sandstone, which was certain soon to begin to decay, and might perish even within his own lifetime. As to the difference in beauty between the clay and the marble in sculpture, he thought in practice that the clay models prepared to carve from were generally superior to the stone copy. Probably most architects had seen clay models which as they left the hands of the artist were very fine, but were entirely spoiled in the reproduction in marble, in spite of the beauty of the material. He was by no means an advocate of the substitution of terra-cotta for stone, but thought each was good in its proper place.

MR. ROBERTSON pointed out that the advantage of carving on brickwork over terra-cotta ornamentation of the same kind was that the carving of the brickwork was done in place, and could be controlled with regard to the effect which it was intended to have from the place where it would be seen, while a terra-cotta panel or ornament must be modelled and burnt separately, and to some extent in ignorance of what its effect would be in place, and it was quite possible that the result would be disappointing, when the work was set, and it was too late to alter it.

MR. LORING asked how Mr. Robertson would alter a moulding cut on the brickwork, if he was not satisfied with it, or whether, if it could not be altered, there was any way of insuring that the carving would be free from mistakes.

MR. ROBERTSON said that mistakes could not be avoided absolutely, but that the chance of obtaining a good effect was better when the designer could study the execution on the spot, than where the material must be wrought elsewhere and brought to its place.

MR. LORING asked if it would not do to have the soft material modelled in place.

MR. ROBERTSON thought that would be an advantage, if practicable.

MR. LORING considered it perfectly practicable, and that there was no more difficulty in modelling the clay in the place it was to occupy than in carving stone in place, with the advantage that a mistake in stone sculpture could not be rectified, while the clay could be added to and changed at pleasure, and fixed by burning when the desired effect had been obtained.

MR. POST thought it would be much more advantageous to have the clay modelled from the drawing by a skilful artist, and then burnt, than to entrust the execution to a journeyman carver. He felt safer with a man held to strict conformity with the drawings by section lines and careful indication, than in sending a workman, perhaps skilful, or perhaps not, to execute the work in place according to his own fancy. He thought it would be difficult to carve brickwork so that the joints would not in the course of years be washed out in our trying climate.

MR. STONE asked what expedient was resorted to in carving brick to overcome the difficulties arising from the porous or cellular structure which most bricks exhibited when broken ; and Mr. Robertson explained that special bricks were made for carving, which were homogenous in texture throughout.

THE PRESIDENT wished to say a word in regard to the remarks that had been made in the course of the discussion on the difficulty of getting good carving in stone or marble. He thought it was entirely practicable to get as good sculpture for architectural decoration as ever was executed. In the Public Buildings in Philadelphia the sculptured parts were first modelled in clay by skilful artists, and carefully corrected in place before handing them over to the workmen for execution. The model was photographed, and the workman followed it exactly. The sculpture for the Capitol at Washington was modelled by Mr. Crawford, and the design was so exactly followed that the finished sculpture could not be distinguished from the model. He thought there was a tendency to ignore the part of the workman in the carrying out of a design. We had men who could do as good and intelligent work as the artisans of any age, and these should be sought out and their position recognized.

MR. WALTER continued with some remarks about the best kind of building stones for use in structures intended to be permanent. In his opinion the true marble was not fit for building; nothing but granite and dolomite, or magnesian limestone, could be depended upon. Architects employed sandstones and marble without sufficient study of their qualities. Marble was quickly acted upon by the acids in the air, particularly by the sulphurous acid evolved from burning coal. In the Mint at Philadelphia it was necessary to take out the marble columns and replace them with granite. No stone that would effervesce with acids should be put into a building, nor any which, like sandstones, crumbled away with the weather. Dolomite, unlike the ordinary marble, was unaffected by acids. A drop of muriatic acid on a piece of marble would run through it, while on dolomite it would remain like water. The crushing strength of dolomite he had found by many experiments to be more than three times as great as that of marble. It was dolomite which was used in the public buildings at Washington, and in those of Philadelphia.

MR. LORING remarked that terra-cotta, or burnt clay, offered a material which could not be affected by acids, and whose crushing strength exceeded that of any stone, under favorable circumstances.

After a few remarks by MR. ADAMS, of the Peerless Brick Co. of Philadelphia, upon the mode of preparing bricks for carving, by excluding the pebbles which were common in bricks as ordinarily manufactured, a vote of thanks to Mr. Beckwith for his invitation was passed, and the Convention adjourned to the following day.

THE ILLUSTRATIONS.

THE ENGLISH HIGH AND LATIN SCHOOL, BOSTON, MASS. MR. G. A. CLOUGH, CITY ARCHITECT.

EARLY in May, 1874, plans for these buildings were submitted in open competition by many architects in Boston and other parts of New England. The competition resulted in the award of the four prizes offered to Mr. Carl Fehmer, Mr. S. J. F. Thayer, Messrs. Ware and Van Brunt, and Messrs. Sturgis and Brigham, all of Boston. Why the first prize design was not carried out we do not know, but we believe that the competition itself is regarded as one of the few public competitions whose conduct left small ground for cavil. The matter was left in abeyance until the institution of the office of city architect in that or the following year made it desirable that the design and construction of these buildings should be placed in the hands of this official. New designs were prepared and accepted, and work was begun during the last part of the season of 1877. Since then the progress has been steady, and now those of the buildings which are to be built at present are roofed in and in the plasterers' hands.

The buildings have three stories and a basement in height. The style is modernized Renaissance, having all the lines of strength treated in stone, the frieze courses inlaid with terra-cotta, while the background is of Philadelphia brick. Practically, the buildings will be fire-proof throughout, each school-room being surrounded by a brick wall, the corridor floors laid on brick arches, and the staircases built of iron. The lot of land upon which these two schools are building is rectangular in its outline, and measures 220 feet by 423 feet. The actual area covered by both buildings is 48,560 square feet, not including the administration building fronting on Dartmouth Street, which is to be built hereafter. The Latin School occupies the building fronting on Warren Avenue, while the English High School fronts on Montgomery Street, the two buildings being separated by the intervening area for light and air, which forms the playground, and are connected only by the drill-hall and gymnasium at the rear, which apartments are to be used in common, and also by a corridor which crosses the area in the centre of the buildings. Each building

contains twenty-four school-rooms, a lecture hall with cabinets attached, an exhibition hall and library room, and living accommodations for a janitor, and the English High School has its laboratory and chemical lecture room. The school-rooms are arranged principally on the street fronts, and each school-room has a seating capacity for thirty-six pupils, the average dimensions being 24 feet by 32 feet, and 13 feet 6 inches in height. The four corner rooms of each of the buildings receive their light by four windows from two sides. All other rooms are to be lighted by the same number of windows on one side, on the left of the pupils. The windows are of large proportions, extending to within 8 inches of the ceiling. The lecture halls and library rooms, both for the English High and Latin Schools, are equally accessible from both buildings; each of these rooms is 42 by 36 by 16 feet high, having an octagonal end extending into the court-yard to receive the light from different quarters; each has a seating capacity for 175 pupils. The exhibition halls measure 82 by 62 feet each, having a seating capacity to accommodate the whole school of 1,000 pupils, and form a central feature of the façades. The rooms on the right and left of each hall are to be fitted up for instruction in drawing, and will be lighted from the ceiling. The chemical laboratory and lecture room for the English High School are in a separate building, octagonal in form, about 36 feet in the square, detached for the purpose of preventing any disagreeable odors from pervading the school building. It is on Montgomery Street, at the end of the school building adjoining the Baptist church, and is two stories high, the chemical lecture room on the first story, and the laboratory above. The drill-hall is a room 130 feet by 60 feet wide, and 30 feet high, and joins the two school buildings across the rear, lying between the chemical laboratory on Montgomery Street and the armory rooms on Warren Avenue; the floor of the drill-hall is of thick plank, caulked like a ship's deck, and laid upon solid concrete, and is to accommodate the whole school battalion; it can also be used for mounted drill.

The buildings will be heated and ventilated by forcing into each room a sufficient quantity of fresh air at a proper temperature which will supply each pupil with eight cubic feet per minute; the supply is admitted into the room at the side next the windows, and exhausted at the opposite side, through ducts of galvanized iron, of the same capacity as the supply ducts.

DESIGN FOR THE TOWN LIBRARY, HINGHAM, MASS. MR. S. J. F. THAYER, ARCHITECT, BOSTON.

MT. IDA MEMORIAL PRESBYTERIAN CHURCH, TROY, N. Y. MR. M. F. CUMMINGS, ARCHITECT, TROY.

This church, dedicated in October, 1878, is built of brick, relieved with Ohio-stone, black brick, and galvanized iron; it is 84 feet long, 44 feet wide, exclusive of tower and transepts, and 60 feet wide including them. The audience room is 29 feet high in the centre; the interior finish is of ash; the walls and ceiling of the audience room are painted, the windows are glazed with stained glass, and the seats are folding upholstered chairs. A gallery for organ and choir is placed in the south transept, over the vestibule. The cost of the building was $9,000.

INTERIOR OF THE DINING-ROOM IN THE HOUSE OF MR. EMMONS, BOSTON, MASS. MR. W. W. LEWIS, ARCHITECT, BOSTON.

CORRESPONDENCE.

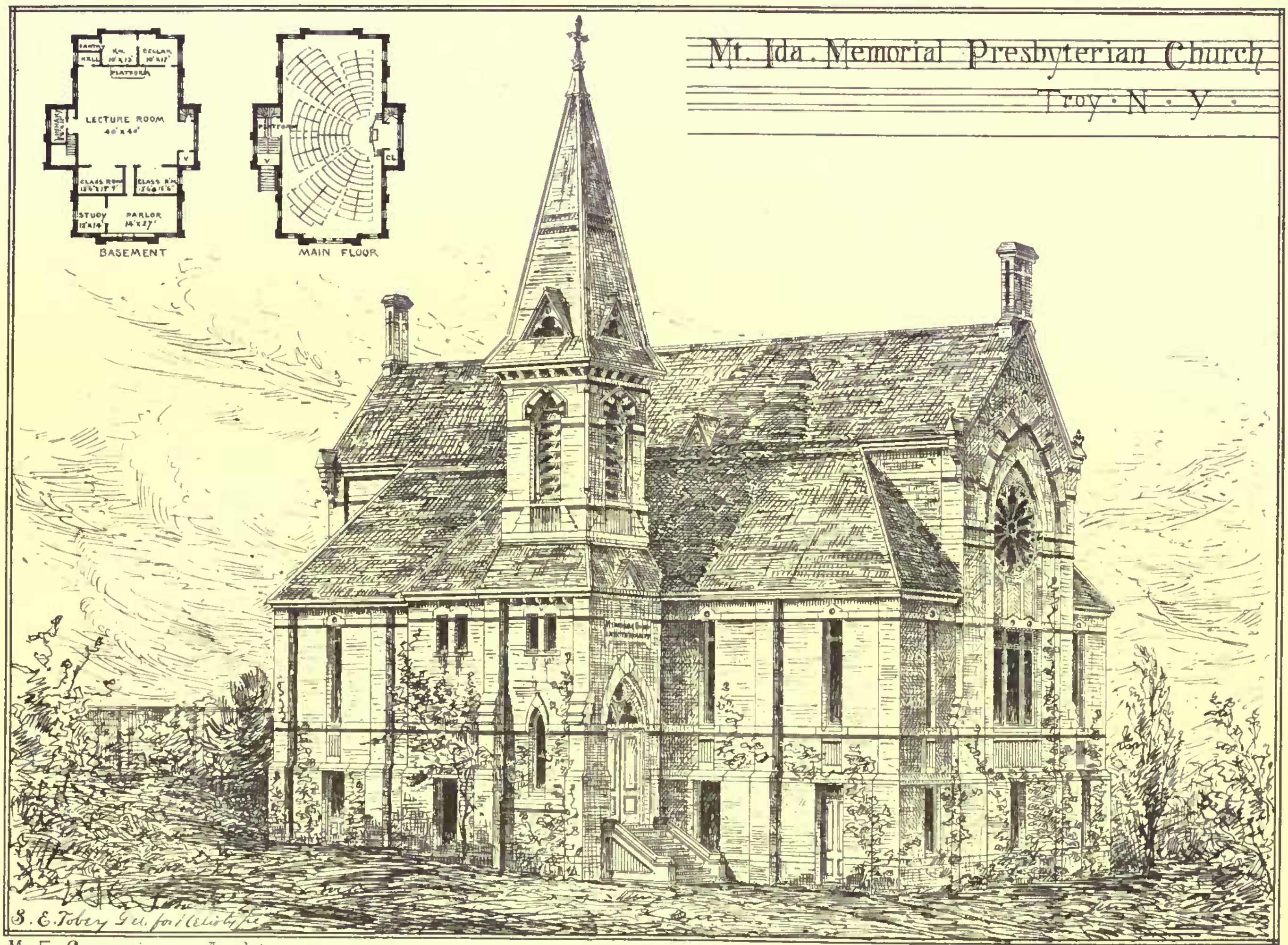
STREET-LIGHTING. — COMPETITIONS. — PUBLIC BUILDINGS.

London, March 14, 1879.

We understand that the trial of the electric lighting of the Holborn Viaduct, which has been going on during the last two months, has not induced the authorities to renew the contract, on the ground of its expense; the cost being so much greater in proportion to the increase of light, that some other means are to be tried before the electric light is adopted as the light of the future. We have not heard yet what conclusion the Metropolitan Board of Works has come to regarding its experiment on the Thames Embankment, but there can be no question that both the above thoroughfares have been better lighted than any others in the metropolis during the present winter, and it is greatly to be regretted that the question of cost should prove such a serious one. We are still awaiting the results of your clever countryman Edison's discoveries; when he gives them to the world in a practical shape, it is just possible they may cause a revolution in the cost, as they are said to do in other matters connected with electric lighting. Meantime, experiments are being made in various parts of the city and in all manner of buildings. Several shops and warehouses are now using the electric light, notably the establishment of Messrs. Shoolbred & Co., in Tottenham Court Road, where it has given great satisfaction. Then among public buildings, both the British Museum Reading Room and the Albert Hall have been tried, the former with fair success, so that there is a prospect of the reading room being opened in the evening erelong, the danger supposed to be more or less connected with the use of gas having prevented hitherto its priceless treasures from being accessible after dusk. At present, however, there is an immense waste of power in the electric light as now used. There is far too much light, and not sufficient means of distributing it. Thick opal globes have to be used to tone down its intense glare, whereby some 40 or 50 per cent of the lighting power is wasted. Then, again, it is too white a light for general purposes, — much more so than sunlight, — so that many things, especially faces, have a ghastly hue under its almost cold blue whiteness. This, of course, could be easily remedied by toning the color of the opal globes so as to produce a warmer effect in the apartment, but no one seems to have tried it as yet. Then it is not at present self-acting. The "candles" are generally arranged in sets, and burn about an hour and a half each. As each pair is burned down, an attendant is obliged to turn the current by means of a handle to the next pair in the set; this is managed so well that not a flicker even is noticed in the transit, but should it be neglected or overlooked, then out goes the light, — a very decided drawback to the practical working of the system as at present understood. Whether Mr. Edison can help us over these difficulties remains to be seen; we hope he may, for doubtless its perfection is only a question of time. As to the cost, this is still an open question, more data being wanted to determine the relationship it bears to the cost of the production of gas; but it is manifest that with greater facility of distribution, and consequently less waste of power, must come cheapness of supply. Not to be easily beaten, however, the gas companies have come to the front with a vastly improved system of street-lighting, which is now being tried in the lower part of Regent Street, Waterloo Bridge Road, and Queen Victoria Street in the city. It consists of powerful argand burners in improved lamps, and there is certainly a vast difference in their light as compared with even the best of the old street lamps. The effect is really very fine, and though perhaps not so powerful as the electric light, it is more pleasant in many ways, especially in color. The lamps are lighted by means of a "pilot light," a small jet which is never turned out during the day: so all that is required to be done in the evening is to turn a tap in the hollow shaft of the lamp-post, and the lamp is instantly lighted; it burns on without further attention till it is turned off in a similar manner in the morning, — a simplicity of arrangement very greatly in its favor. Of course the cost is much in excess of the ordinary lamp, just as the light is, but in what proportion remains to be determined. One result, however, is said to be attained: that seven times the consumption gives eight times the lighting power, this being due to the improved construction and arrangement of the burners. Piccadilly Circus and the lower part of Regent Street are extremely well lighted, and there seems to be a certainty that at last we may look forward to seeing the streets of London decently lighted, either by gas or electricity, or by both. It may be added that the electric system principally in use is that known as the "Jablochkoff."

A good deal continues to be said on the vexed question of competitions. Recently the president of the Institute advocated a competition of "men" as against the usual competitions of designs, and the Truro Cathedral architect was selected somewhat after this fashion, as Mr. Pearson did not submit any design for the proposed building, but rested solely on his reputation and his executed works. Two important competitions going on at present have excited more than ordinary attention: one is for new public buildings at Greenock, where, after offering the usual premiums and stipulating that the committee is not bound to carry out any of the designs, it makes a condition that the architect appointed is to be paid a commission of only four per cent on the outlay. This disregard, by a public body, of the recognized charges of the profession has of course brought about vigorous protests, including official communications from the British Institute and the Glasgow Society of Architects, but without effect, the committee declining to alter its conditions.

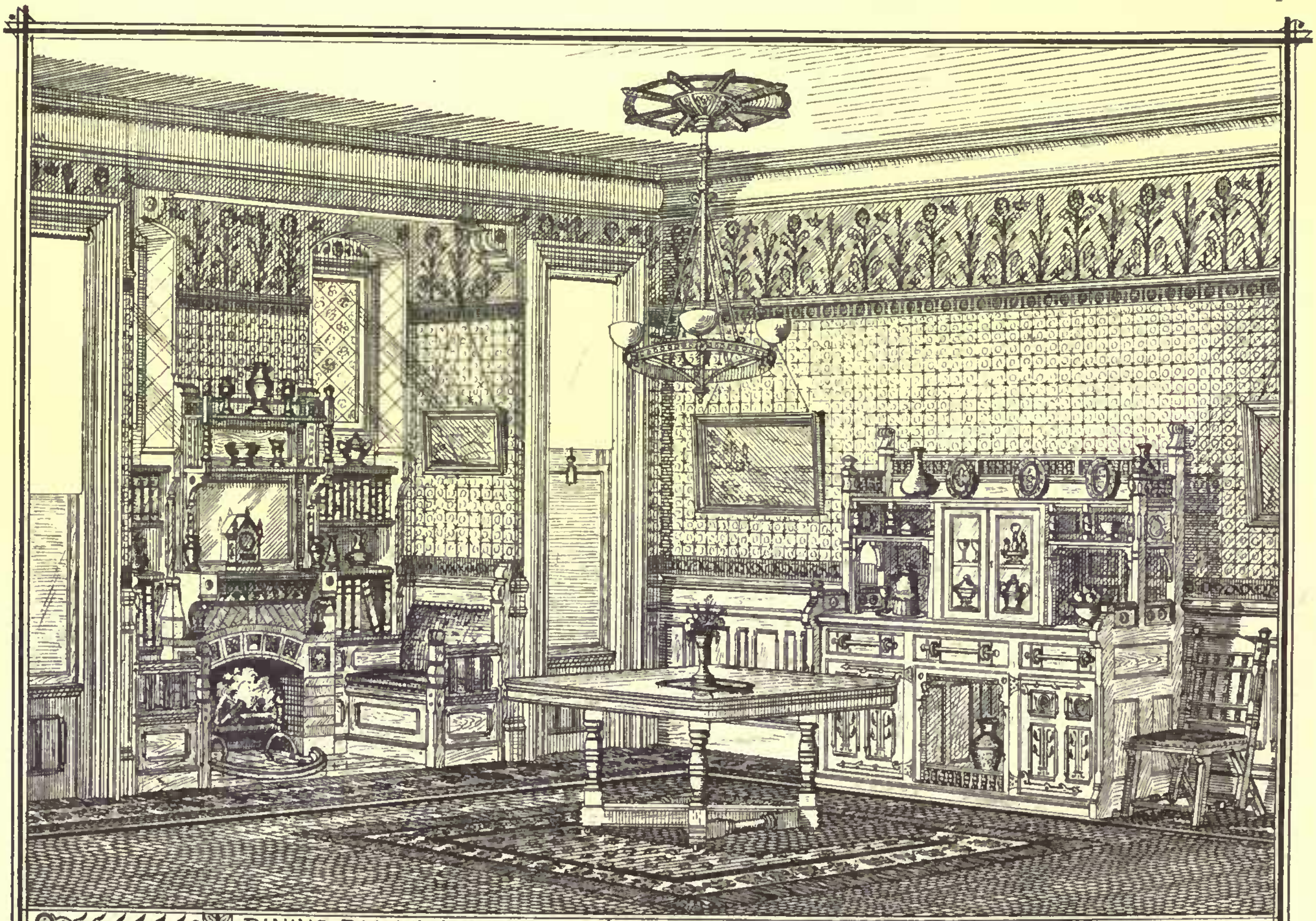
The other case is that of the City of London School. The governors propose to build new and very extensive premises on a splendid site on the Thames Embankment, and offer three premiums of £300, £200, and £100 respectively, but they ask such an enormous amount of work from the competitors that these premiums are a mere delusion. The building will probably cost some £70,000 or £80,000, if not more, and full working drawings, large-scale drawings, specification, and guaranteed estimate are required for each design. For a building of this cost the usual charge would be from £1,750 to £2,000, at two and a half per cent on the amount; so the governors become possessed of three designs for £600, for which, under ordinary circumstances, they would have to pay something like £5,000 or £6,000! This is not taking into account the value of the work of the unsuccessful men, but only those designs for which some payment is offered. The committee intend to recommend the successful competitor as architect for the work, but as a matter of fact the city architect has already prepared designs for this new school. How is it to be known that after all this first design may not be erected, or even perhaps improved by the experience gained from the three prize designs of the competition? The governors ask too much; a complete set of working plans from each competitor is fifty per cent more than is necessary to show either the fact or the intention of a design, not to mention the large-scale, — or, as architects would call them, detail drawings and specification. We are often told that the profession has the cure in its own hands: Don't compete; for it is evident the more building committees ask, the more they are likely to get. But that is simply begging the whole question. If architects, through the medium of their recognized societies, or one of the general conferences they have been so fond of holding lately, but once agreed to a certain code of rules, on which alone they would enter into competition, and faithfully acted up to them, we should very soon have less of lowered commissions, or increased drawings, specifications, and contracts. Competition is not in itself a bad thing; many a reputation has been made through its



Mt. Ida. Memorial Presbyterian Church
Troy. N. Y.

S. E. Tobey Del. for Heliotype

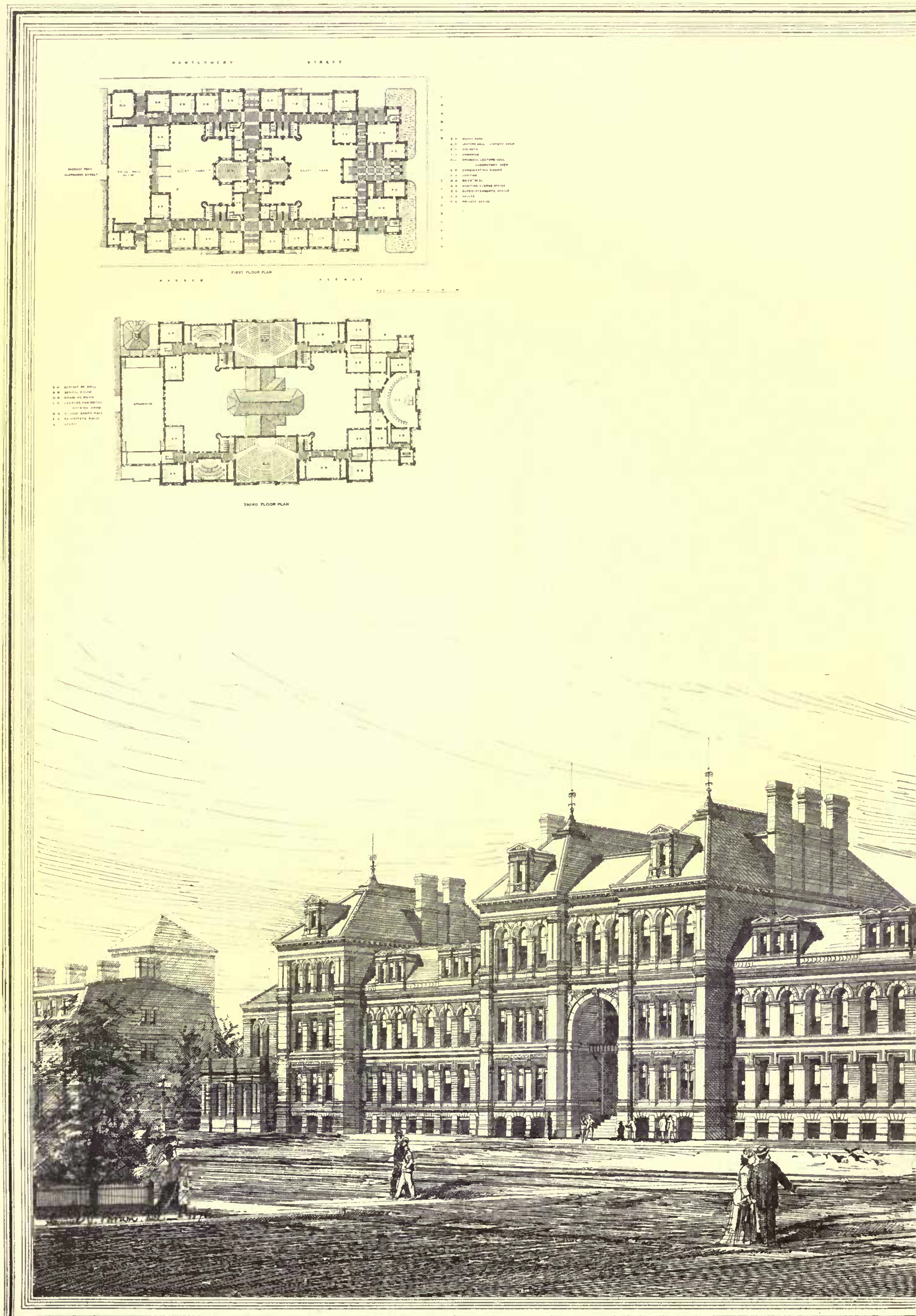
M. F. Cummings Archt. Troy N. Y.

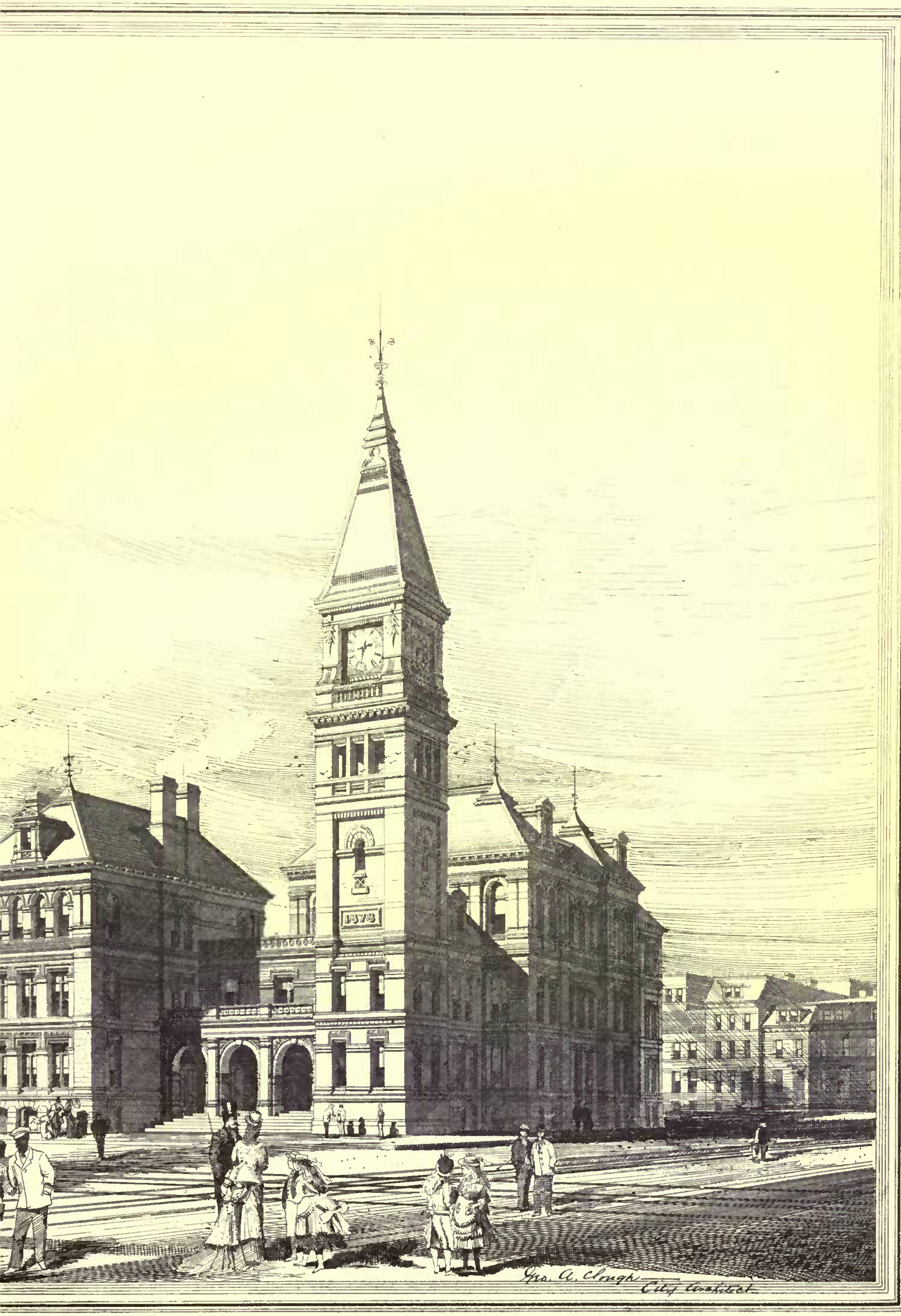


DINING-ROOM IN MR. N. H. EMMON'S HOUSE – COMMONWEALTH AVENUE. W. W. LEWIS – ARCHT. 5 PEMBERTON SQUARE.

The Heliotype Printing Co. 220 Devonshire St. Boston

B. C. Pond. Del. 1878.


MONTGOMERY STREET
FIRST FLOOR PLAN
THIRD FLOOR PLAN

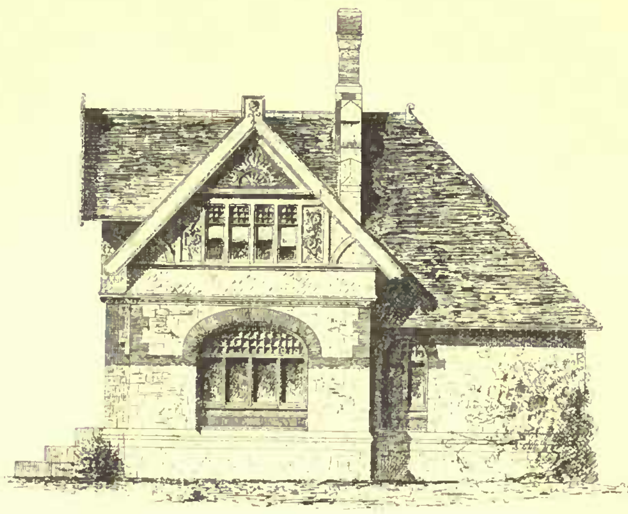


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UILDINGS, BOSTON, MASS.



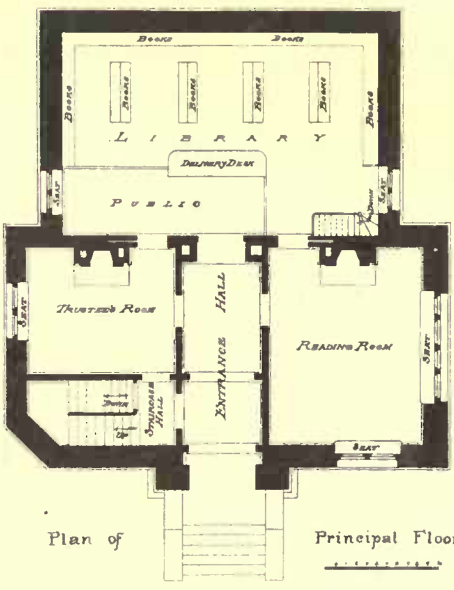
Principal Elevation



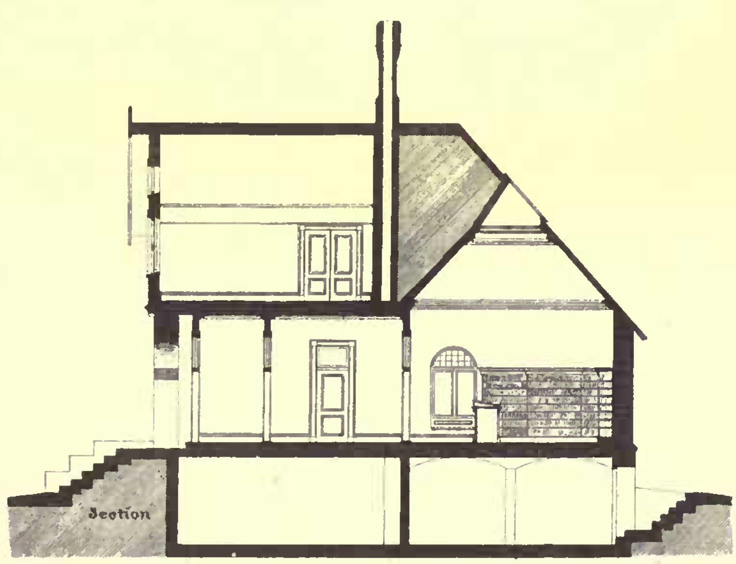
West Elevation

Design for Library Building Hingham Mass.

Sam. J. F. Thayer Archt.



Plan of Principal Floor



Section

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

means, and properly conducted it may be the means of bringing many men to the front, who, but for such an opportunity, would probably never be much heard of. The whole system wants thorough reforming, and, until this is done, its principal results can be only heart-burnings and disappointments.

After Easter the recently completed block of the New Law Courts is to be occupied for business, and many of the chancery and other officials will find themselves in quarters much more suitable for the transaction of public business than the rookeries they have been scattered about in for so many years past; but it will probably be another couple of years yet before the next portion of the vast pile is ready.

We hear that the completion of the Opera House on the Embankment having become perfectly hopeless, it is proposed to acquire the site and the building, so far as it has been built, for the purposes of a Colonial Museum, such an institution having been decided on after the close of the Paris Exhibition. The site is a very good one, and worthy a national building of some kind. The new mint is also to be erected on the Thames Embankment, so there is some prospect of the Metropolitan Board's pet roadway becoming a very fine street some day; it and the Holborn Viaduct are about the best things that have been done. It is to be hoped, though, that the architecture of the Embankment will be better looked after than that of the Viaduct, than which nothing could well be worse.

THE COMPETITIVE PLANS FOR THE NEW LEGISLATIVE BUILDINGS. — A LOCAL LAWSUIT.

St. John, N. B.

The month of January found most of our architects busy preparing competitive designs for the New Legislative Buildings at Fredericton, N. B. The designs were sent in on the 1st of February, but remained untouched until Parliament assembled, about the end of the month, and quite recently they have been open to public inspection in the Board of Works office. No less than ten of the fourteen designs are from St. John, and as they were not sent in under a motto, or *nom de plume*, we are able to give the names of the competitors, to wit: Mr. Walter Chesterton, Ottawa; Mr. Andrew Dewar, Halifax, N. S.; Messrs. G. & G. Brown, Montreal; Messrs. Stirling & Harris, Charlottetown, P. E. I.; then from St. John we have Messrs. M. Stead & Son, Mr. Morgan Smith, Mr. Frank Kain, Mr. J. C. Dumeresque, Mr. C. O. Wickenden, Messrs. Brown & Allison, who send two designs, Messrs. McKean & Fairweather, Mr. H. F. Starbuck, and Mr. Merry.

A memorandum of instructions was given with a plan of the site, and the accommodation required was very explicitly stated. The rooms needed were enumerated, their superficial area given, and in some instances the floors on which certain rooms were to be placed. The cost of the building was not to exceed $100,000. The prizes offered were, first, $500; second, $300; and third, $100. One clause said that "no use will be made of the plans retained under the second and third premiums unless by arrangement with the authors and for proper compensation." But who is to decide whether, and how much, these plans are used, and the amount of compensation to be paid to their authors?

We infer that the decision of the judges will be based on the satisfactory way in which the instructions have been followed in the designs. The assembly room and the supreme-court rooms were required to be on the ground floor. The legislative library might, at the choice of competitors, either be detached, or form part of the main building, and it had to be fire-proof. This, and its capacity (20,000 volumes), naturally suggested its being placed also on the ground floor. The position of the legislative council-chamber was left open, and as its size was only 1,500 feet superficial, and the present legislative council-chamber is on the second floor, many of the competitors have placed it there. The chief difficulty in the planning was how to get, in a building where so great an amount of accommodation was required on the ground floor, compared with that on the upper floor, sufficient height to give dignity to the exterior. We notice that several of the competitors, in order to gain an imposing elevation, have provided more accommodation than called for on the second floor. Some have even a third floor to certain parts of the building, whilst others show elevations with dormer windows above the second floor, as if there were a third floor, but on looking at their sections we find these windows light only the space under the roofs! Clock-towers to the Gothic designs, and domes to those of classic design, seem to have struck all the designers, save one or two, as being necessary to the proper appearance and effect of a Parliament Building such as the New Brunswick legislature required.

Generally speaking, the planning is very poor, and respecting the artistic merits of the designs we would prefer saying nothing. Only four or five of the competitors have faithfully carried out the instructions, and of these, some have defective points in the plan. Many of the competitors seem to have wasted too much space in entrances and halls, and it is very questionable if such designs, with lofty domes, can be carried out for the sum named. Mr. Merry's design, for instance, has an entrance hall 30 feet wide leading into a circular "rotunda" 43 feet in diameter. The staircase hall to the left is 34 feet by 30 feet. All this seems large for the business to be done in the building.

In Mr. H. F. Starbuck's design he seems to have obtained staircase hall and entrance area, at the expense of the other rooms. His assembly room, which is an octagon 39 feet across (measuring at right angles to the sides), has not area enough for the throne, passage ways, desks and seats for sixty members, with free passage way between each. The legislative council-chamber has only 1,211 superficial feet, instead of 1,500 feet as called for in the instructions. Some of the other rooms are less in area than required; there are no committee rooms on the ground floor, and two rooms, with water-closets and urinals, have no light or air from the outside. The reading room and smoking room are in the basement. All the committee rooms are on the second floor; but there is no lavatory or water-closet on this floor.

Messrs. M. Stead & Son, one of the oldest established firms here, have sent a carefully prepared design, Gothic in style, but, like some of the others, they show no committee rooms on the ground floor. The assembly room, which is placed centrally, is lighted partly from the roof, and by a clerestory above the level of the second floor ceiling. The legislative library is a detached circular building, 50 feet in diameter, to the rear of the main building; its window sills are 30 feet from the floor line, the space below them being given to the book-shelves. There are no apparent means of ventilating this room, except by opening panes in the traceried windows. From the ground line to the vane is about 100 feet. Portions of the main building are carried up, forming a third floor, giving height to the front, and providing more accommodation than actually required.

Messrs. Stirling & Harris, of Charlottetown, P. E. I., and Mr. Walter Chesterton, of Ottawa, place the supreme court on the second floor.

Mr. Frank Kain's design covers a large area, and is badly planned; for instance, the speaker would have to traverse a distance of 114 feet from his room to the throne, and the two clerk's rooms, each 28 feet by 6 feet, are equally far from the assembly room.

Mr. J. C. Dumeresque is one of the few who have abided by the instructions, and there are some very commendable points in his plan. There is an inner area, however, which is not desirable in a country where much snow falls; and the corridor at the side of the assembly rooms has not sufficient light. The same objection might be made to the hall leading from the central hall.

The designs submitted by Messrs. R. Brown and J. C. Allison, marked respectively A and B, seem to be the least costly of all those exhibited. Design A has no more accommodation than called for, and design B only two rooms more than required. Design A has the building in two blocks, with the principal staircase in the centre between the two. The rear block has the assembly room surrounded by corridors, and all the committee rooms in connection with it. The rooms adjacent to the assembly room are only one story in height, so that the assembly room has light from three sides, the fourth being occupied by a gallery for the public. The front block has the supreme-court room and rooms in connection with it at one side of the centre, with a special entrance as well as connection with the main corridor. On the opposite side are the reading room, the smoking room, and the legislative library, which has also a separate entrance. On the second floor, to the front, are the legislative council-room and rooms in connection therewith. The style of this design is Greek in character, somewhat plain and severe. The addition of a tower or dome might have added to the effect, but the authors seem to have aimed at economy. Design B is quite different in plan, and covers less area. The legislative library is placed to the rear of the main building. The assembly room is in the centre, lighted from two sides on the second floor, and also from the roof. The committee rooms are on one side of the building, on the ground floor, and the supreme-court and barristers' rooms on the opposite side, with separate entrance. The legislative council room and rooms connected with it are on the second floor to the left. A "governor's room" and committee rooms occupy the right side of this floor. There are lavatories and water-closets on each floor, entered from the corridors.

Messrs. McKean & Fairweather's design is Gothic in style, with a central tower over the entrance. The committee rooms are ranged along the front, opening from a main corridor running parallel with the front, on the opposite side of which is the assembly room. On the left is the supreme-court and its several rooms, separated from the assembly room by open areas, which are covered over with glass roofs above the second floor. All the lavatories, water-closets, urinals, etc., and the ventilating shaft, are placed between the two areas. To the rear of the assembly room are the speaker's room and other rooms connected with the assembly room. The legislative library is detached from the main building and placed in the rear. On the second floor we have committee rooms over the corresponding rooms below, and galleries round the assembly room, and on the left of the building the legislative council room, and the several rooms connected with it.

Mr. C. O. Wickenden's design has a central staircase hall, with a dome over it. The assembly room, in his plan, is placed to the right of the central corridor, and is lighted on two sides, the front and rear. The committee rooms are ranged on each side of the central corridor leading to the legislative library in the rear. The supreme court is to the left of the central staircase, and the legislative council room is on the second floor. There is a basement plan, in which are care-takers' rooms, and other rooms suitable for offices. The front elevation shows blocks at the extreme ends, which are four stories in height, including the basement. The style is Italian Renaissance.

Quite recently an important case has been decided in our law

courts. Mr. H. F. Starbuck, architect, sued Mr. J. W. Nicholson for payment for plans which were made by him for the said J. W. Nicholson. The defendant urged that the plans made by plaintiff were for a house costing considerably more than the sum mentioned when he instructed him to prepare them. On bids being received at a high figure, the defendant left the matter in abeyance, and finally asked plaintiff, through another party, to send in his account. This plaintiff did, claiming three per cent on the cost of the house as tendered for, making his account $600. Mr. M. Stead, architect, gave evidence in the case that the charge was in accordance with the scale approved by the Institute of Architects in England and the United States, but the jury awarded the plaintiff something like $400, being three per cent on the sum the house should have cost.

The trial of a case like this suggests one or two reflections. It is well that all architects should be sufficiently paid for their work, but while taking refuge behind the code of fees adopted by the Royal Institute of British Architects and the American Institute, the public may require to know some time whether all architectural ability is of the same value.

M. C. T.

THE LOAN EXHIBITION. — NEW CHURCHES. — BUILDERS AND ARCHITECTS.

BALTIMORE.

ON the 4th ult. the new art rooms in the recently completed Peabody Institute were for the first time thrown open to the public, the occasion being the opening of an art loan exhibition. The collections are arranged in a suite of three apartments. The first contains pottery and porcelain, bronzes, *repoussée* metal work, ivory carvings, lace, and bric-à-brac generally, while the walls are hung with ancestral portraits belonging to many of the older families of the State and city, with several pieces of Flemish and Spanish tapestry. Sèvres and Dresden porcelain of the different periods are well represented, while there are many rare pieces of Worcester, Russian, Japanese, and Chinese ware. Tiffany & Co., of New York, exhibit, among other things, some reproductions from the Di Cesnola and Castellani collections, several flagons of hammered silver, decorated with colored enamels, and a rare collection of curious watches, dating from the earliest periods, many of them richly chased and jewelled. Their examples of the ancient pottery of India, reproduced in the Royal Art School at Bombay, are worthy of study. Among the most notable bronzes is the Toying Page, by Keyser, of this city. There are also some very fine Russian and Japanese groups.

A second gallery contains a very good collection of modern paintings, nearly all taken from the private collections of this city. The third room is devoted to casts from the most important works of Rhinehart, the Baltimore sculptor, lately deceased at Rome. His heroic statue of Chief Justice Taney occupies one end of the room, while near it is a bas-relief of the sculptor, surrounded by the wreath of laurel intertwined with modelling tools sent from Rome with his remains. At the extremity of the picture gallery stands his chief work, Clyte, conceded a high rank among the works of American sculptors. The exhibition is considered a success, and has been very popular. It will remain open some time longer.

The Eutaw Place Presbyterian Church, Messrs. Dixon and Carson, architects, was dedicated on the 9th ult. The exterior is of serpentine, with ornamental parts of Berea sandstone. The interior is 58 by 78 feet, with a height at ridge of 74 feet, — dimensions which would not seem conducive to fine acoustic effect. The roof, of Southern pine, is quite elaborate, and of a single span, the thrust being chiefly resisted by immense exterior buttresses. The large east window, with stone tracery, is filled with very good stained glass, but unfortunately the organ has been placed so as almost to hide it from the interior. Most of our churches and halls of assembly are defective in not having sufficiently roomy or direct staircases, and other means of rapid egress in case of fire or panic, and this church seems to be no exception to the rule. The fact is largely owing to an absence of strict laws on the subject here. The La Fayette Square Presbyterian Church, by the same architects, is also of serpentine, with finish of light sandstone. In design it is striking as being quite a departure from the vernacular. The line of the front gable is carried nearly to the ground by a very large flying buttress, while from its point of departure another heavy flying buttress is built at right angles to the gable wall. This immense resistance is massed against a very unpretending pinnacle, which would seem to be amply sustained by the wall upon which it rests. A rectangular tower, surmounted by a very steep gabled roof, and carrying a round turret in the centre of its street face, rises from the opposite side of the front.

Not many blocks away towers the huge mass of the Pius IX. Memorial Church, by Mr. Frederick. It is built of local blue gneiss, with finish of white marble. The aisles each measure fourteen feet, and the nave twenty-eight feet, in width, while the entire width, outside of the towers, is seventy-four feet, and the length is one hundred and forty eight feet. The interior is somewhat obstructed by the iron columns of the clerestory, which are nearly three feet in diameter. It is to be vaulted in plaster.

In an evil hour, some two years ago, quite an appropriate, and the first thoroughly constructive, design in iron was erected here. Since that time we have been treated to mangled reproductions of it, adapted to all kinds of locations, the columns being squeezed together or dreadfully attenuated to suit all demands, until we are forced to cry, Hold, enough! This great facility of reproduction is almost enough to cause the profession to eschew iron for building purposes, as a substitute for brick and stone.

The architects here seem almost in danger of being superseded by the builders, "practical men," so called. A very costly dwelling is at present going up in the most fashionable part of the city, for which the architects are employed by the builder merely to furnish sketches of detail, etc. The rule, even among those who aspire to be considered judges in art, appears to be never to consult an architect, but, apparently to save the paltry five per cent, always to call first on the "practical man," and if he chooses he may deign to ask an architect to help him out. This is partly brought about by the profession in working directly for builders, and giving them partial services at greatly reduced rates, and partly by an almost universal lack of appreciation of the value of the services rendered by a trained and skilful architect.

The architectural descriptions of the daily press here are often amusing. We were informed lately that a row of houses was of "Eastlake design," with "tasty" carvings. A slip of the compositor as to the first letter could almost be pardoned oftentimes, as it would wonderfully add to the truth, if not to the beauty, of the description.

CIVIS.

THE MARKET-HOUSE COMPETITION AT ST. PAUL, MINN.

MINNEAPOLIS, MINN., March 27, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Some days after my communication of the 11th, Mr. Bassford, of St. Paul, published a card in the *Pioneer Press*, making a statement in regard to the market-house competition which shows him to have acted fairly in the matter. This I at once mailed you, but from your comments in your issue for the 22d I judge it came to hand too late, if received at all. Such being the case, it is but fair to Mr. Bassford to say that from his card it appears that he and Mr. Radcliff agreed to bid four per cent, but afterwards reconsidered, and both agreed to put in a bid of three per cent for their services, after which the bids actually put in were as stated.

Yours, etc., F.

THE CONSTRUCTION OF HOSPITALS.

PHILADELPHIA, March 24, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — During the past ten or fifteen years a very considerable number of hospitals have been built throughout the United States, giving evidence of great liberality and of much sympathy for the sick and suffering. Many of these buildings have been very costly, and some have aimed at considerable architectural effect, but it is safe to say that few or none have been constructed with a thorough appreciation of what are the highest needs of such a building.

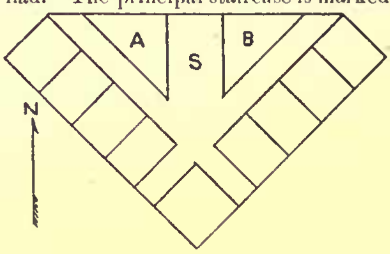
Fifteen or twenty years ago some details were first published from the Paris hospitals, proving that a considerably larger proportion of those patients recovered who were in wards having a free exposure to sunlight, than of those in wards less favored. These facts arrested attention, and were evidently very important; I endeavored to have them largely circulated in this country. Not long after, I was shown the plans of a large hospital about to be built in a New England city, and pointed out to the trustee that the architect, with a singular want of acquaintance with the needs of the case, had given the best exposure on the main floor to the apothecary's shop and various offices, whilst the sick wards had chiefly northern exposures.

The advantages of sunlight for the sick have been of late years much better understood, and faults like that just mentioned would scarcely be committed now. Efforts have been made to secure sunlight for all the wards, but not, as I think, very successfully. A fine hospital was built some years ago at Providence, R. I., in the planning of which much attention was paid to the question of sunlight, and the plan decided upon was as follows. The building was placed with its greatest length due north and south, so that the wards looked exactly east and west respectively, one set of wards receiving the morning, and the other the afternoon sun This plan was so favorably received that many hospitals since built have been constructed upon it. I am informed that this was done in the case of the Roosevelt and the Lenox hospitals of New York city, and, if I am not mistaken, the plan was adopted also by the trustees of Mr. Johns Hopkins in Baltimore.

I feel reluctant to make any criticism on a system which was the outcome of so much intelligence, thought, and painstaking labor. But this plan of construction, whilst it gives a little sunlight to all the rooms, affords a sufficiency to none, and actually throws away the most valuable of all, the winter sunshine. In the winter, the sun, even at rising, throws its rays obliquely on a due east exposure, and these rays become continually more and more oblique. As every one knows who has observed, the really effective winter sunshine is that between eleven and one o'clock, and this, upon an eastern or a western exposure, falls so very obliquely as to be of little value. In a building constructed upon the above-mentioned plan the whole midday force of the winter sun is thrown upon the narrow end of the building, which either is a blank wall, or else represents the sides of two only out of the whole number of wards. In summer, the arrangement is almost equally unfavorable. In our climates almost all the air in the hot summer weather comes from the south. A room

with a southern or nearly southern exposure will have a faint but most welcome air moving in at the window, when rooms with northern, eastern, and western exposures do not receive a breath. It thus follows that even in summer rooms with southern exposures are found the most desirable.

In the plan which I annex, I have endeavored to attack the difficulties of hospital construction in a new manner. The building has a somewhat triangular shape, and the wards all face either southeast or southwest, so that they all receive ample sunlight, and in summer get all the breeze that is to be had. The principal staircase is marked S. In the space marked A are intended to be placed the baths and water-closets on each story; also the store-rooms. In the space B is placed, on the ground floor, the kitchen; on the second floor, the apothecary's shop; on the third floor, the operating room, for which, with its north light and sky-light, it is particularly well adapted.



As my intention has been only to give a general idea of the plan, I have not indicated the smaller divisions. I am aware that those architects whose main object it is to produce a showy building will object to the fact that the face on which the main staircase opens is not terminated by right angles. If this objection is insisted upon, it can be met by sacrificing a ward in the centre of one of the square sides, and treating that side as the main front of the building. I have preferred, however, to draw the plan in the manner that gives the greatest possible advantage to the interior.

Inspection will show that excellent ventilation is obtained by the halls, which cross each other at right angles; so that in whatever direction the wind may come, these halls, opening southeast, north, and southwest, must carry air through the whole building. The triangular spaces on each side of the main staircase, the shape of which would be objectionable for wards, are perfectly well adapted for the uses assigned to them. Very truly yours, M. CAREY LEA.

THE COLEMAN COUNTY COURT HOUSE.

TOPEKA, KANSAS, March 25, 1879.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Gentlemen, — In my recent communication concerning the Coleman County (Texas) Court House, I stated the weight of materials in the construction to be 160 pounds. This is published " 16 pounds." Please correct it. Yours, etc., L. M. WOOD.

CERTAIN MISTAKES OF PLAN IN HOUSE-BUILDING.

WHEN failure is the result of work involving the combined action of principal and agent, it is next to impossible to prevent the recurrence of like failure, until it is definitely settled to which of them it belongs. Thus, in such a matter as the building of houses, when wrong is done, the fault, generally speaking, lies with either the architect[1] or the owner, but in the case of most of the mistakes which I shall notice presently, the fault does not lie with the profession: not that the profession can do no wrong, but because these mistakes have their origin in something outside of the profession; in ignorance on the part of those who build, *i. e.*, the public; ignorance not so much of how to do as of what to do. The average citizen is not expected to have a familiar knowledge of strictly professional matters; on these points he asks the architect for information, whose duty it is to tell him, and who is bound to use in the telling the best of his professional skill and learning, how to build his house; but who does not tell him what sort of house he is to build. It is certainly reasonable to expect a man who is about to build a house, to know such simple matters as the number and character of the rooms he will have; but unfortunately this is what many good people do not know, and here is where the first mistake is made. For these people in their ignorance err on the side of having too many rooms. This is especially true of persons of the class of *nouveaux riches*. It may be that they would provide for the wants of a growing family; or perhaps they have a mistaken notion that the larger their house the better it will sell; but in nine cases out of every ten, it is safe to say that the real motive is an ambition which is only another name for the love of show. These persons have read somewhere that all men are free and equal; they have read somewhere else of the multitude of apartments in a British nobleman's mansion, and they straightway conclude that they, being equal to him, must do as they suppose him to do. Their notions on the subject are a jumble of hall, drawing-room, morning-room, dining-room, library, study, boudoir, billiard-room, breakfast-room, music-room, reception-room, and so on. They go to work and build a house containing all these rooms, to which they add several others of their own invention, until there is a separate room for the performance of almost every act of daily life. But as so much magnificence costs a great sum, and as there is a limit to the depth of most men's pockets, they economize by copying the stone-work of their model in wood and plaster, and the wood-work in paint; they cheapen the foundations, thus weakening the house; they make thin walls, that do not keep out the cold and wet, trusting to the hot-air furnace to remedy these defects, which it usually does with a vengeance, by baking the inhabitants in a slow oven.

If these people knew a little less than they do, or a little more, they would be better off. If they knew a little less they would be free from a very foolish ambition; if a little more, they would know that a considerable portion of their British nobleman's income is used in taking care of his well-built house, and repairing the damage done by ordinary wear and tear; and *a fortiori*, that their own badly built house would need a much greater outlay for the same purpose. Usually in this country the style of living becoming these large houses is beyond what their owners are able or willing to maintain; and the houses themselves, after a few years of unhappy residence, pass into the hands of the auctioneer.

A sensible man, in building his house, proceeds upon a very different plan. He wants just such accommodation as will be of use to him, and no more. He knows that for the average American family in good circumstances three principal rooms are sufficient: drawing-room, library, and dining-room; there is use for these, therefore he will provide them; also a hall, by means of which to reach the others, and a vestibule, or porch, or both, as shelter for the hall. He also omits that odious apartment, the family sitting-room, for he knows that the three other rooms make sitting-rooms enough, and that if any room in the house is too good for every-day use, that room has no right to exist. The habit of keeping shut-up parlors for occasional company is so absurd that it is difficult to give people who practise it credit for ordinary common sense. Such parlors are like tombs in the rare event of their being opened, and the visitor is tempted to wish that they might do duty as tombs for those who endanger his health by taking him in there.

Another common mistake of plan is the small scale of the kitchen and offices as compared with the family rooms. I will illustrate by referring to an apartment house I know of, where the drawing-room and the dining-room are each about the equivalent of twenty feet square, the library not much less, and all three connected by immense folding doors, and the kitchen is barely six feet by eight, and containing wash-tubs at that! This is an extreme case, but a great many otherwise good houses are worse off in this respect than they should be. A kitchen, if work is to be well done in it, and dinners to be well cooked, should not be less than the equivalent of fifteen feet square, and should be still larger in a large establishment, employing many servants.

The communication between the kitchen and offices and the apartments occupied by the family, and the concealment of the former from public view, are matters which are much neglected. The usual arrangement, where the kitchen is above ground, is to place between it and the dining-room the butler's pantry, with doors to both rooms, often directly in line. This makes the best possible conveyance for smells from the kitchen to the dining-room, and thence, by the simple process of opening the hall door, to the rest of the house. In the case of a basement kitchen the same result is obtained by having the basement stairs open, instead of enclosed, as they ought to be. The English manage this matter better than we. They put next the dining-room sometimes the butler's pantry, but more frequently a small serving room, opening not to the kitchen, but to a passage leading thither; and this passage is made the only means of access from the family rooms to the kitchen and offices, which are, if not in the basement, in a wing, under a separate roof from the main building, so that by the closing of one door, or at most two, all communication is cut off, and the smell of cooking does not annoy the family. The great distance of the kitchen from the dining-room in some houses might seem a fault, but it is better than the other extreme of having it too near.

The English also erect before the kitchen-wing of a house a wall of the same material as the house, and treated architecturally in the same style. This wall both conceals the kitchen and offices, and encloses that most useful feature, the house yard. That such an arrangement is very uncommon with us, I know well, the only places where I have seen it being those city lots which are fortunate enough to have an alley in the rear.

A common thing in country houses, though often omitted in city houses, is a servants' staircase. People of small means, who can have but one servant, insist upon the separate staircase for that one, while many a city family with three or more servants gets along perfectly well without it. The persistency with which country people ride this favorite hobby amounts almost to fanaticism. The second staircase, a great convenience in a very large house, is out of place in a small one, there being nowhere to put it, and to a small family is unnecessary, and therefore wasteful. The money might better be used for the kitchen yard.

The place of a veranda may seem a matter of small moment; yet this adjunct of a house may be either a great comfort or a great nuisance, according to its position. Most people seem to think it should be on the sunny side of a house, where it darkens the rooms, itself being ablaze with light, and hot as a furnace. The object of a veranda is not to keep the light out of the rooms, because this can be better done by the window hood, or by closing the shutters; but to

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[1] I am aware of an apparent exception in the fact that the contractor may not do his duty; but this does not alter the rule, for theoretically, at least, the architect watches the contractor, and compels him to do right; just as in building a railroad, the work is let out to the lowest bidder, without much regard to his qualifications: it being assumed that he knows his business, besides which he is constantly looked after by the chief engineer and his assistants.

afford a cool, shady place, out of doors, and yet sheltered, for summer use. Hence it should be on the shady side of the house, or that side which is in the shade in the afternoon. Here it is really enjoyable. To provide against too much shade for the rooms behind it, there should be, if possible, one or more windows on some side of the room not covered by the veranda, or if this cannot be, the windows looking upon it should be made very large, and the veranda itself of light construction, and painted as light a color as the rest of the house will admit. And let no one be worried about too much light in the house; there are many days when there cannot be too much, and when there is, it is easy to shut it out.

A good deal of what I have written is stale enough to the architectural profession; but I know very well (perhaps the better because I am not of the profession) that though they have done and are doing much to improve the architecture of this country, they can do nothing more than what they do with the help of the public. And as this magazine is read by the architectural public, my hope of reaching that public must be my apology for having written at all.

C. C. E.

COMPETITION IN INTERIOR DECORATION.

PROGRAMME NO. III. — A GALLERY RAILING.

The subject for the third competition will be the railing inclosing the lowest gallery of a natural history museum. The railing will be 2' 9" high, made of brass or wrought-iron, and supporting in one way or another the gas fixtures which serve to illuminate the hall.

Required: an elevation, a perspective of a corner of the gallery, and details of railing and gas fixtures at a larger scale.

Drawings must be received at the office of the *American Architect* on or before May 10.

NOTES OF EXPERIENCE AND INEXPERIENCE.

13. Waring's Check-Valve. — "Anxious Architect" did not ask for, and he may not be satisfied with, the inventor's reply to his question (No. 168, p. 88). As I have doubtless used my check-valve more than any one else has, I am qualified to give an account of it, — due limitations because of my personal interest in the matter being applied by the reader. I regard it as a decided success. It never fails, — or hardly ever. On wash-basins and bath-tubs, where the overflow line (the valve seat) can be placed as much as ten inches below the outlet of the vessel, it discharges rapidly, and is kept clean by the flow. At less depth it may retard the outflow and accumulate lint. In the case of a kitchen sink or a pantry sink it is desirable to give even greater head. Indeed, when possible in these cases, I put the check-valve under the floor, say two feet below the outlet. With these sinks and with laundry trays I have found it better to use a round ball in place of the cup-valve, as in some instances the accumulation of grease above the cup has held it down so as to choke the outlet. Laundry waste has more or less lint, and in one case it has been found that this wound itself around the stem of the valve and kept it from opening. With the ball this cannot happen. The greater the flow the better, — a one-inch check-valve on the outlet of a set of laundry trays is sure to be kept clean by the great rush of water through it. If placed low enough below the outlet (say ten inches) it does not check the flow. It is important that the outlet of the sink be guarded by a fixed strainer, for the valve will not pass a dish-cloth, nor a potato paring. The most modest statement that I am disposed to make about the check-valve is that its use insures the absolute exclusion of drain air, and that, if properly arranged, it does not increase the usual difficulty from the accumulation of rubbish in the waste-pipe. I say this after long and thorough trial.

Geo. E. Waring, Jr.

18. Mixing Plaster In-Doors. — Does the slacking of lime in the cellar of a building, for mortar, plastering, etc., have any effect, deleterious or otherwise, on the timber of the building?

E. B.

NOTES AND CLIPPINGS.

Lighting Flouring Mills. — In order to avoid a recurrence of the disastrous explosion which last year destroyed the Washburn Mills, at Minneapolis, Minn., a new method of lighting has been adopted which promises much greater safety from fire and explosion. The jets are confined in glass lanterns to which air is supplied from the outside of the building, direct through pipes, and the jets can be turned down but not out during the daytime. By this means no flour dust, "red dog," or any of the products of the grinding can reach the blaze, and there is no exposure while lighting.

Spontaneous Combustion. — E. Bing, of Riga, has experimented with different materials, — wadding, raw flax, hemp, the waste from silk, wool and cotton spinning, as well as sponge, and finally wood dust as found in any cabinet-maker's shop. They were saturated with various fluids, namely, oils, fresh and in a gummy state, turpentine, petroleum, various varnishes, etc. All the fibrous materials took fire when saturated with any of these oils or with mixtures of the same. Sponge and wood dust, on the contrary, proved to be entirely uninflammable. Combustion ensued most rapidly with 17 g. of wadding, and 67 g. of a strong oil varnish, in 34 minutes; while 200 g of washed cotton waste, of which a portion was saturated with 750 g. of strong oil varnish, and the remainder wrapped about it, required almost 14 hours. These materials were placed in a well-sheltered spot, and subjected to a heat of from 18° to 40° (C.). Silk did not flame up, but slowly charred. Small quantities seemed to take fire sooner than large. — *Wochenschrift des Ver. deutsch. Ing.*

Mill-Owners and Fire Escapes. — The Supreme Judicial Court of Massachusetts has sent down a decision of more than ordinary interest to mill-owners and their employees, in which it is held that it is not the duty of mill proprietors to their servants employed in a building which is properly constructed for ordinary business carried on within it, to provide means of escape or to insure the safety of the servant from the consequences of fire not caused by his negligence. The issue was raised in the case of Ellen Jones against the Granite Mills Company at Fall River, in whose mill a conflagration occurred September 19, 1874, with terrible loss of life. Plaintiff was an employee of this corporation and brought action of tort to recover for injuries which she received at the time of the fire, through her inability to escape from the sixth story of the burning mill except from the gable window.

Preservation of Iron. — Captain Bourdon has devised simple forms of apparatus for coating iron with Barff's magnetic lacquer. In the course of his experiments he found that the coat of oxide could be formed by the air in the following manner: The serpentine part of a sheet-iron reservoir communicates with air which is heated to 248° F. The current of hot air, after circulating through the serpentine, reaches the cylinder which contains the articles to be lacquered. The escape spout communicates with a water aspirator regulating the flow of air, which should be very gentle. The internal pressure is little more than one atmosphere, the apparatus being in communication with the open air. The temperature of the air in the cylinder is 536° F.; the operation lasts five hours, giving a coat 0.05 of a millimeter thick (0.002 inch), of a beautiful greenish black, resisting the action of fine emery paper and of dilute sulphuric acid. After the articles are taken from the cylinder, they are rubbed with a greasy rag, and spots are removed by fine emery paper or scouring grass. Spots may generally be avoided by suspending the pieces, so that they will not touch each other or the walls. If the temperature is raised to about 572° F., a thick coat is secured, but it is apt to scale. Articles thus lacquered have been exposed to snow and rain for a month without getting any spots of rust. If the black coating is removed by emery paper, there is a grayish layer on which rust does not take much hold; the spots can easily be removed by a bit of hard wood. Barff has observed the same peculiarity in articles which have been steam lacquered. — *Annales des Ponts et Chaussées.*

Grandeur in Architecture. — "It is remarkable that architecture is the only art in which mere bulk is an element of sublimity. There is more grandeur in a Greek gem of a quarter of an inch diameter, than in the statue of Peter the Great at Petersburg. There is more grandeur in Raphael's Vision of Ezekiel than in all West's and Barry's acres of spoiled canvas. But no building of very small dimensions can be grand, and no building as lofty as the Pyramids or the Colosseum can be mean. The Pyramids are a proof; for what on earth could be viler than a pyramid thirty feet high?" — *Lord Macaulay's Journal.*

Improving the Tiber. — The Minister of Public Works at Rome has given orders to the engineers and contractors to push the work of improving the Tiber in and around the city, especially at the point of the river crossed by the picturesque old bridge of St. Angelo, which, in a measure, is to be renovated.

The Legend of Cologne Cathedral. — A correspondent of the Buffalo *Courier* relates the legend of Cologne Cathedral in a form slightly different from the one that it usually wears. He says: "As the story goes, the inventor was walking, one day, by the Rhine, trying to think out some design which should be sufficiently grand, and sketching his thoughts in the soft sand at his feet. At last he was satisfied, and said, 'It shall be like that.' 'Oh, I will show you a much better plan,' said a voice behind him, and on turning he saw the figure which has become familiar to the readers of Faust, and to the users of profane language. With his cloven hoof this newly found friend drew the outlines on the beach with startling rapidity and skill. But he had met his match in this plain German workman. He was made to explain minutely every detail, for the trembling architect knew that probably his own soul would be the price of this knowledge. Then he said to Mephistopheles, as he suddenly thought of a way out of the difficulty, 'Your plan is not quite satisfactory; I will not take it.' The soft voice of his hoof-footed visitor became a rough roar. He saw that he had been outwitted. 'You may build your cathedral according to this plan,' he shrieked, 'but you will never finish it!' This was seven hundred years ago. The satanic threat was not vain. Though multitudes of men have worked upon it for hundreds of years, the cathedral has never been finished. Now, as if in despair, the authorities have apparently turned once more to the outwitted but revengeful author of the design. The tickets of a gigantic gambling scheme, called the 'Cologne Cathedral Lottery,' are sold in every town of the empire, and the profits form a church-building fund. If the famous black gentleman is ever influenced by flattery, and by humble appeals for his assistance, we may soon expect that the curse will be removed and the great cathedral completed."

Harbor of Alexandria. — Alexandria has the largest artificial harbor in the world. The outer breakwater is two miles long; a tongue of land curves around the harbor, so that there is no exposure to the winds and waves, except the straight and deep canal which serves as an entrance. The breakwater, quays, and jetties were finished in eight years. — *Les Mondes.*

New Mode of Manufacturing White Lead. — The molten lead is poured through an iron sieve into a tank filled with water. Hereby it is converted into threads one sixth of an inch in thickness, which are now placed in vats, each of which holds about 1,000 threads. Vinegar is now poured over the lead, and immediately drawn off again. Under the influence of the air and the vinegar adhering to the metal, the latter is oxidized. The vinegar is now poured into the vat and again drawn off, when it carries away the acetate formed on the surface of the metal in solution. After this process has been repeated a number of times, the vinegar has been transformed into a concentrated solution of basic acetate of lead, from which the carbonate may be prepared by the introduction of a current of heated carbonic acid gas. The supernatant liquid, mixed with another quantity of vinegar, is used again for the same process. — *Chemiker Zeitung.*

THE AMERICAN ARCHITECT AND BUILDING NEWS

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CONTENTS.

PEOPLE are not wont to attach much importance to the prophecy of the "straws" which political busybodys are so fond of collecting on the morning train, at the exchange, or in the workshop, at election times, and perhaps architects and builders will not feel that the reports which we have received from some score or two of the largest cities in the country are straws of sufficient significance to affect either their spirits or their calculations. Yet such as they are, they are probably as reliable as statistics usually are; and as they indicate more or less clearly what the building outlook for the present season really is, we trust that all our readers will give more than ordinary attention this week to our columns of building intelligence. If these reports are not all rose-colored, and if in some of the cities the prospect is still gloomy, as in Cincinnati, the indications seem to be fairly satisfactory on the whole, if not as encouraging as the low price of materials, the rate of wages, and the state of the money market would lead one to expect. As one of our correspondents says, it would take a prophet to predict what the season really will be; but surely the omens seem propitious. As will be seen, all over the country, from Milwaukee to Austin, from Boston to Denver, almost every one speaks with a hopefulness which not a few substantiate by statements of work which will be undertaken this season. The tokens of a returning prosperity, which would be hastened, doubtless, were it not for the dread which the business man feels of unwise and injurious legislation on the part of Congress, are apparent on all sides, one of the most important of these being the preparations which the iron-masters throughout Ohio are making for increasing their operations. But no rose is thornless, and our correspondent at Memphis closes his letter thus: "I have given you a sad but true statement of our prospects. The last scourge we had played havoc with us, and I am afraid it will be some time before this place recuperates from it. It hangs to-day like a nightmare on our people: should it make its appearance again, then this city is doomed, for thousands would leave never to return." It is only too likely that other Southern cities which were fever-stricken last year are in like circumstance.

IT seems as if the matter which most demanded instant attention were, What steps shall the nation take to suppress this dreadful pest? — for it is a matter of national, and not merely local interest; and we hope that the National Board of Health, which was organized last week at Washington, will concentrate its energies first upon a solution of this question. We do not remember what conclusions as to the vitality of fever germs were reached by the Yellow-Fever Convention which was held last autumn at Richmond; but we believe that the reappearance of yellow-fever on board of the United States man-of-war Plymouth, as soon as she had raised her temperature, to use a medical phrase, by approaching the latitude of the West Indies, will be received with wide-spread surprise and alarm. It has been generally agreed that cold destroys the fever, whether it is sporadic or epidemic; yet here is a vessel which, because her crew suffered from yellow-fever last year, was thoroughly fumigated and frozen, which has wintered at Boston, but on which, nevertheless, the fever reappears as soon as she reaches a warm latitude. If such a recurrence can take place on board of a man-of-war, where scrupulous cleanliness is enforced, what will happen in so unclean a city as Memphis, or in New Orleans? where it is said the pauper dead, the negroes, and the yellow-fever victims are buried in two small graveyards year after year, — graveyards so small, so the story goes, that in sickly seasons it is necessary to dig up those who have been buried longest, in order to make room for the later unfortunates; so that now it is about time to dig up those who died of the fever nine months ago. Be this as it may, a correspondent of the *Staats-Zeitung* gives a most alarming account of the present condition of that city, and of the *insouciance* of its inhabitants. Surely, if Massachusetts felt it to be her duty, some years ago, to stamp out the cattle plague by buying with the public money and then killing every animal which showed symptoms of the disease, it is the duty of the National Government to follow, as far as circumstances will permit, an analogous course in regard to yellow-fever. Humanity of course will not allow the destruction of individuals attacked by the disease; but as drugs, fumigation, and cold seem to be alike impotent, it is time that fire were tried, and that every building in which the fever has appeared, as well as all clothing and household goods in it, should be bought by Government and then destroyed; but first, and most important of all, a law should be passed compelling the instant cremation of any one who dies of the fever. Such a course, doubtless, would be in the highest degree distasteful to many; but it seems plainly to be our duty to look upon the dead bodies of yellow-fever sufferers not as the remains of dear friends, but as almost certain sources of contagion.

OF the four classes of buildings whose destruction by fire is likely to be attended by great loss of life, — hotels, theatres, churches, and school-houses, — there is less excuse for the burning of school-houses than for either of the others. The dangers to which theatres are exposed are exceptional, and, though well understood, are difficult to guard against; hotels, though protected to a certain degree by the irresponsible oversight of their frequenters, are nevertheless quite at the mercy of the individual vagaries of their numerous tenants; while in churches, which are used only occasionally, both by day and by night, the heating and lighting apparatus, not being constantly in use, can be held excusable if they sometimes give cause for a fire. But school-houses are not especially subject to any of these perils. They are, as a rule, occupied only by day; their heating apparatus is under the control of a competent janitor; and, aside from the thoughtless incendiarism of pupils, who have an unconquerable inclination to play with matches, they are exposed to no dangers which the architect and builder are not competent to provide against. Yet they are continually getting on fire, and imperilling the lives of those who, of all the community, should be protected most carefully, in that they are least able to care for themselves. The latest mishap to a school-house is the partial burning of Public School No. 17, on West Forty-seventh Street, New York, on April 3, at a time when there were in the school-rooms and in the yards twenty-three hundred and fifty children, more than fifteen hundred of whom belonged in the primary department, and were therefore probably less than ten years of age. It is supposed that the fire was ignited by overheated steam-pipes passing below the floor of the lowest story. Here, as in a notable case in the West, a year or two ago, the safety of the children depended on the firmness and presence of mind of female teachers, who fortunately were not found wanting; but were able to dismiss the children in good order, and so avoided the fatalities which must have resulted from a panic. We note that the Board of Education is likely to borrow $500,000 for the purpose of building new school-houses, and we hope that these new buildings will be thoroughly fire-proof, well lighted and ventilated, and sanitarily perfect.

IN whatever reforms result from the present agitation of the tenement-house question, the Building Department of New York must take a leading part, and it is satisfactory to be able to believe that the present superintendent, Mr. Dudley, seems to be willing and able to effect reforms in his own department, for which there was a crying need, as we stated in our issue for August 10, 1878. On coming into office in January of this year, Mr. Dudley discharged every man in the department who did not come up to the standard fixed by the existing statute,

one of whose sections declares that "all the officers of said department, except the attorney, clerks, and messengers, shall be either practical architects, house-carpenters, or masons, and shall have served a regular apprenticeship as such," and must obtain from a board of examiners a certificate of competency. In filling such vacancies as it seemed best to fill, the provisions of this section have been followed strictly, and, as might have been expected, less than one quarter of the applicants for office succeeded in passing the examination. One of the most tangible results achieved by the new superintendent is a saving, during the two months of his service, of nearly three thousand dollars when compared with the corresponding months of the preceding year, and of nearly five thousand dollars when compared with the expenses of the department in the first two months of 1877. In the matter of tenement-houses, certain reforms seem to have taken place already, and now not only the letter of the building law is enforced, but the requirements of the tenement-house act and the regulations of the Board of Health are insisted upon, doubtful plans being submitted to the revision of the Board of Health and its suggestions carried out. For example, ventilating shafts, which before this year could be carried up within the building, and were usually provided with a skylight, which was of course closed in cold weather, thus nullifying the chief object of its being, must now be built so as to be inclosed by the main walls of the building and must be open at the top, or in other words must form small open courts, which in adjoining buildings must correspond one with the other. Mr. Dudley is credited with saying that many of the plans submitted in the late competition for tenement-houses would not have passed the Building Department, while some of the plans which received prizes did not fulfil all the requirements of the Board of Health. This better spirit within the Building Department is encouraging, and augurs well for the reforms which may result from the passage of any law relating to tenement-houses, such as that which Mr. Murphy has just submitted to the Legislature of New York.

WE have not the full text of all the sections of this bill before us, but it does not promise to meet the case in a perfectly satisfactory way, and its provisions are somewhat blindly stated: thus, when it declares that no tenement-house shall be built on any lot "unless there is a clear, open space exclusively belonging thereto, and extending upward from the ground of at least ten feet between said buildings, if they are one story high above the level of the ground; if they are two stories high, the distance between them shall not be less than fifteen feet; if they are three stories high, the distance between them shall not be less than twenty feet; and if they are more than three stories high, the distance between them shall not be less than twenty-five feet," is it to be understood that this space is to be measured at the rear of a lot, or is each building to be isolated from its neighbors by the spaces mentioned? If this is its meaning, it is to be feared that real-estate owners will have influence enough to defeat the bill. The last part of this section seems to indicate that this is the intention, for it goes on, "No one continuous building shall be built or converted to the purposes of a tenement or lodging house in the city of New York upon an ordinary city lot, to occupy more than sixty-five per centum of the said lot." The sections relating to ventilation are so broad as to be almost of no effect, for after providing that the hall of every tenement-house shall have a ventilator and a skylight of patterns approved by the Board of Health, they declare that every sleeping-room shall be ventilated either by direct communication with the open air, or with a room having such direct communication, or with the entry or hall of the house, — provisions which would give to the penurious and unscrupulous landlord all the latitude he could desire. It would have been fair to expect that a bill which provided that thirty-five per cent of a lot should not be built upon, while the building was separated from its neighbors by spaces varying from ten to twenty-five feet in width, would stipulate that every sleeping-room, at least, should have direct communication with the open air. Although we suppose that this bill is based upon a system of building-lots other than that now in use, we recall more than one plan submitted in the late competition which covered not much more than sixty-five per cent of the lot, and yet had an outside window for each bedroom; so that this unwillingness to demand proper ventilation seems quite unnecessary. Another section provides that when any tenement-house, or any room in one, becomes so crowded that less than six hundred cubic feet is afforded to each occupant, an order is to be issued by the Board of Health, requiring that the number of occupants be reduced; but the harshness of this provision, which smacks of bow-strings and quick poison, is somewhat softened by the stipulation that the Board shall "deem it to be wise or necessary" so to do; but it is to be feared that in face of the certain opposition of landlord and tenant the Board will not be wise enough to issue such orders as often as it should. If, as is stated, these are the most important provisions of the bill, we feel that, radical as it is, it will fail to effect the needed relief.

ARE architects more venal than other professional men, or are these, too, tempted by offered bribes? Do clergymen receive circulars from publishers, promising that if they will persuade all the members of their Sunday-schools to buy their new book on the Salvation of the Soul, they shall receive a valuable consignment of books for their own shelves? Are doctors approached by the makers of quack medicines with the offer that if they will prescribe their nostrums for every patient, doctor and undertaker shall share the latter's fee? Lawyers are, perhaps unjustly, supposed to be the tempters quite as often as the tempted, though in a different way, so that it is not worth while to ask whether they receive circulars similar to the postal-card which Charles W. Trainer & Co., of Boston, have sent lately to architects, with its statement that they "are ready to pay you a liberal commission if you can influence your customers to use our asbestos ready mixed paints." The dull gold background on which this tempting invitation is printed has a well-to-do air and seems to assure the hesitating practitioner that the commission will be so liberal that it may be worth his while pecuniarily to swerve from the straight path of professional honor. We cannot be expected to note all such cases, but when so flagrant an instance is brought to our notice it is worth while to expose it, as a reminder to business men that by far the larger part of the profession prefers to depend for its support on the regular professional fees. The offering of commissions is regarded, we believe, in business circles as a well-recognized and perfectly legitimate method, and at the first blush it is a little difficult to see in what way a dealer sins more in offering a commission to an architect, than when he grants a discount to an ordinary customer. But the dealer must be made to understand that when he offers such a commission to an architect he tempts him to a breach of trust, which we are not sure is not actionable at law; and that the architect who accepts such a bribe places himself in the unenviable position of one who violates that dictum of the common law, which declares that in the same transaction a man may not lawfully be an agent for buying and for selling.

THE OPEN FIRE-PLACE. X.

VENTILATING STOVE FIRE-PLACES WITH FRESH-AIR CIRCULATION.

WE now come to the iron fire-place with direct or straight smoke flue and circulating air flues. Fig. 75 represents the fire-place of M. Leras, professor of physics at the Lyceum of Alençon, France. The fire-place is very shallow, and consequently a great amount of radiant heat is obtained. The fresh air circulates first under the hearth, then behind the back and sides of the fire-place, and finally escapes into the room through the register at the sides of the mantel. The fire-place opening is covered with plates of polished copper to increase the radiant heat. This fire-place is expensive, difficult to repair when out of order, and liable to smoke on account of its incorrect form. The chimney-throat just above the fire is too large, and the back of the fire-place retreats above, where it should advance. The upper part of the flue shown in Fig. 52 increases in size suddenly in the section where the iron flue enters the chimney. This sudden increase would be unnecessary except as a transition from an oblong to a square flue.

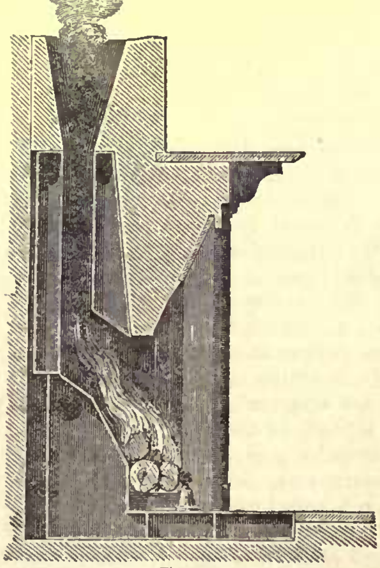


Fig. 75.

Figs. 76 and 77 represent another device with a better section of the flue. Under the hearth is a shallow rectangular case of sheet-

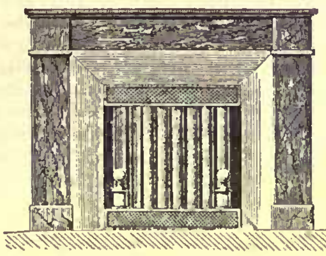


Fig. 76.

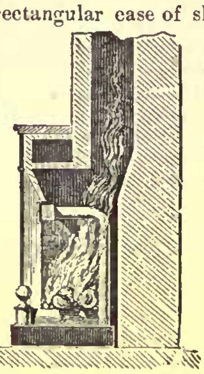


Fig. 77.

iron communicating with the etxernal air. Upon the rear part of this box are fixed a number of bent tubes for conducting the air from it to the fresh-air register above the fire. The burnt air passes between the tubes before entering the brick flue, and warms the fresh air in its passage to the room. Fig. 78 gives in section a fire-place with the tubes for fresh air horizontal instead of perpendicular. This arrangement is less effective than the preceding, in which a draught of fresh air into the room is produced in the tubes by the height of the column of warm air in them independently of the chimney draught. With horizontal tubes no such independent draught exists. The apparatus represented in Figs. 79, 80, 81, and 82 consists of a sheet-iron open stove fitted into the opening of a fire-place over a fresh-air inlet situated under the hearth. A register opens into the room from the upper part of the stove, through which the warm air enters. The stove consists of two sheet-iron boxes, one inside of the other, so as to leave a space between them for the circulation of the fresh air. The iron smoke-flue is furnished with a damper at its junction with the stove, which is its proper place. The cheeks of the iron case are pierced with small metal plates, which extend into the fire and into the air spaces between the two cases. The outside air enters through the fresh-air channels, rises, and comes in contact with the ends of the metal plates heated by the flame at the

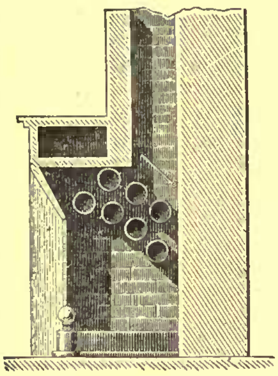


Fig. 78.

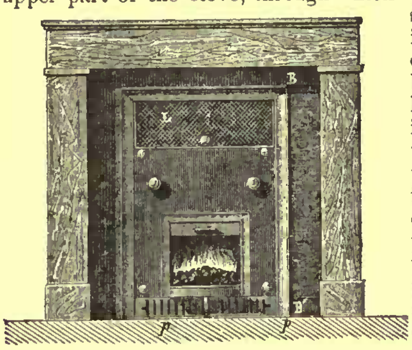


Fig. 79. Front Elevation.

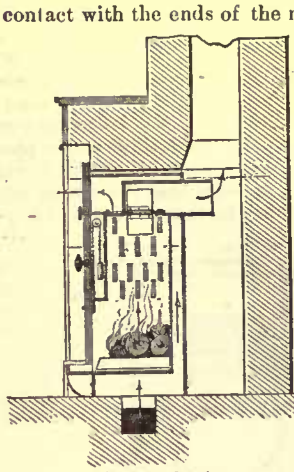


Fig. 80. Section.

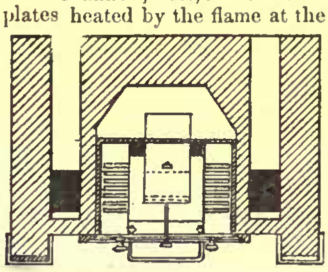


Fig. 81.

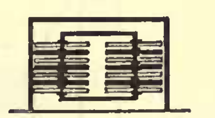


Fig. 82.

opposite ends. It then enters the room through the register just above the fire. The apparatus is somewhat complicated and feeble in heating power. The heating surface added by the plates is too small to justify the outlay; moreover, the spaces between them would quickly get clogged with soot, and to clean them would be exceedingly inconvenient.

If these plates were omitted, as shown in Fig. 83, a better form of ventilating fire-place would be obtained.

The fire-place of Fondet is represented in Figs. 84 and 85. It is composed of two horizontal cast-iron cylinders united by a number of small upright prismatic tubes arranged in rows, diagonally opposite and behind each other, in such a way that the smoke can pass between them before entering the chimney flue, as shown by the arrow in the section. These tubes, which thus form the back of the fire-place, connect with the fresh-air inlet duct at the lower end, and at the upper with the warm-air registers at the right and left of the mantel, as shown in the elevation. The fresh air circulating through them is warmed by the fire, and then thrown into the room through the registers. The soot is removed from the outsides of the small prismatic tubes by means of a thin scraper passed between them.

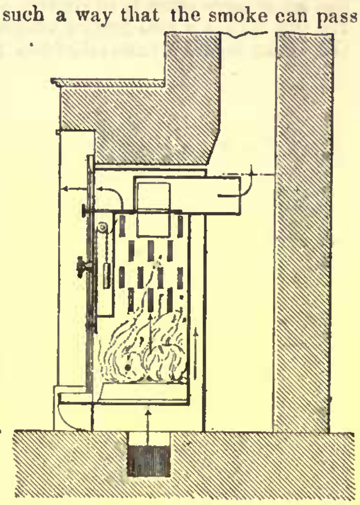


Fig. 83.

This apparatus is now one of the most extensively used in Paris, and gives the greatest satisfaction. It is, however, open to the objection of obstructing passage into the chimney flue in a manner which renders the removal of the soot from the latter quite difficult.

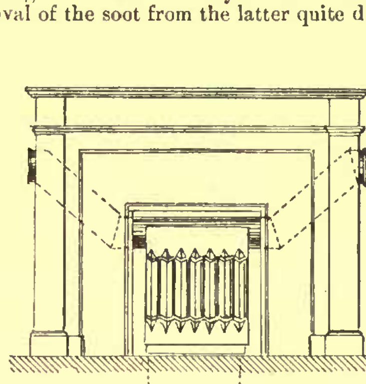


Fig. 84. Fondet's Fire-Place.

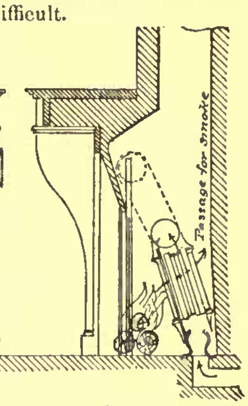


Fig. 85.

To obviate the objection, Cordier modified the back so as to render it movable. During the sweeping of the chimney the back can be moved to the position shown by the dotted lines in Fig. 86, thus entirely opening the mouth of the chimney. In other respects the operation of this apparatus is like that of Fondet. Fig. 87 shows it in perspective. Fig. 88 shows the movable back, with the collars on the right and left of the upper horizontal cylinder to shut over the ends of the same when in position, for the purpose of keeping out the soot. The upright tubes in the Cordier fire-place are larger than in that of Fondet, and present more heating surface. At the same time they are less easily burned out. To increase their durability, however, the small perforated shield Fig. 89 is fitted to the front of the tubes to protect them from the immediate contact of the fire and fuel. Fig. 90 shows the fire-place back in profile.

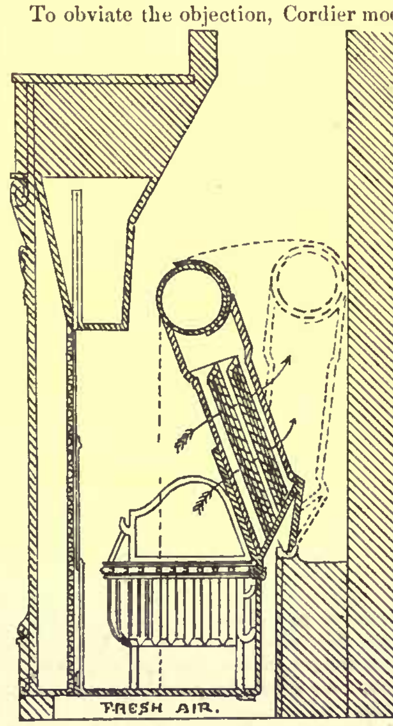


Fig 86. Section of Cordier's Fire-Place. From Bosc.

According to M. Bosc, a French architect and writer on heating and ventilation, the calorific power of this apparatus is much greater than that of Fondet. He gives the results of some experiments made by the Central Society of Architects, Paris, to show this. The experiments were made in a room, he says, containing about fifty-four cubic meters of air. At the moment of lighting, the thermometer stood at 17° centigrade. Nine kilograms of wood were burned, and at the end of two hours the thermometer stood at 30°, showing an increase of 13°. A similar experiment, made a few days afterwards in the same room with one of Fondet's better-known fire-places, gave, in the same time and with the same amount of wood, an increase of only 7° instead of 13°.

In Fig. 87 is shown behind the mantel a portion of the smoke-

flue made large enough to contain a number of small fresh-air tubes. By this means a still greater amount of heat may be extracted from the smoke before it enters the brick flue. But the upper enlargement

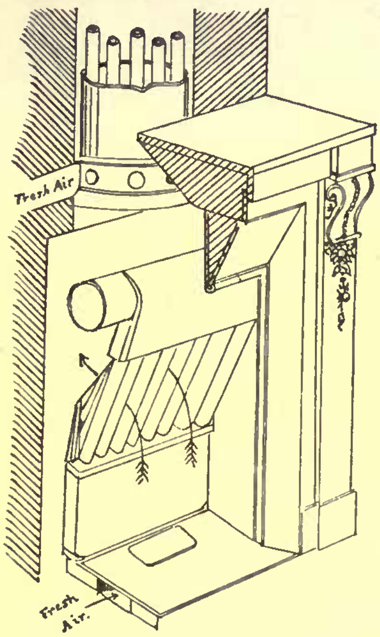


Fig. 87. Perspective View of Cordier's Fire-Place. From Bosc.

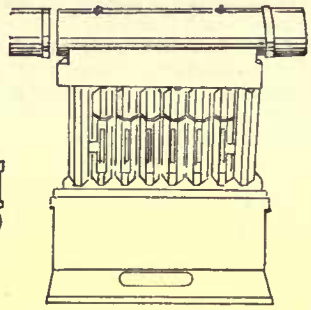


Fig 88. Back of Cordier's Fire-Place. From Bosc.

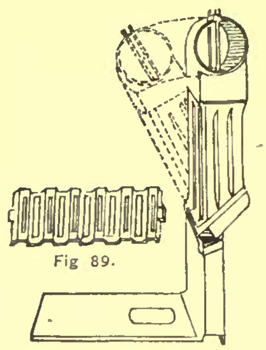


Fig 89.

Fig. 90.

with enclosed air tubes does not form a necessary part of the apparatus. It is objectionable, as well on account of its costliness and complexity as on account of the difficulty of cleaning or making repairs.

The Lloyd fire-place is represented by Figs. 91, 92, 93, 94, and 95. Two strips of sheet-iron, bent as shown in Fig. 94, are fastened to the back of the fire-place, of which Fig. 92 gives a horizontal section, and make the fresh-air flues shown in Fig. 95. These two side flues are connected above the fire-place with a cross tube square in section (Fig. 91). The fresh air enters behind the fire-place, circulates below, on each side, and above the stove, and enters the room just over the mantel at the back edge of the shelf, as shown in the vertical section (Fig. 91). This fire-place is to be highly recommended on account of its extreme simplicity. But the radiating surface of its heating flues being small, compared with those of Cordier, Fondet, Joly, Peclet, Descroizilles, and others, it is correspondingly deficient in calorific power. In common with all the above mentioned fire-places, it is objectionable in bringing the air into immediate contact with highly heated iron about the grate and burning fuel. For the purpose of deriving the utmost advantage from an open fire, the radiant heat of the fuel, which, on account of its preciousness (from a sanitary point of view), might be called "golden" heat as distinguished from the ordinary heat of convection, should be made the most of. To this end the back and sides of the grate or fire-place should be constructed of the best radiating or reflecting material, avoiding the metals. Fire-clay, tiles, or soapstone should be sought. The conducting materials may be used in places comparatively remote from the fire, whereby the waste heat of the smoke may be saved without danger of burning the air. Or, in other words, the conducting materials should be used higher up above the points available for radiation.

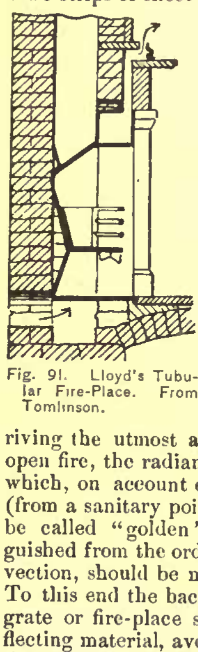


Fig. 91. Lloyd's Tubular Fire-Place. From Tomlinson.

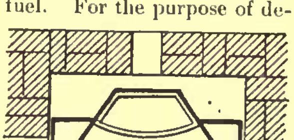


Fig. 92.

Mr. Lloyd placed a strip of metal on the mantel just in front of the warm-air entrance, with the idea that it was necessary in order

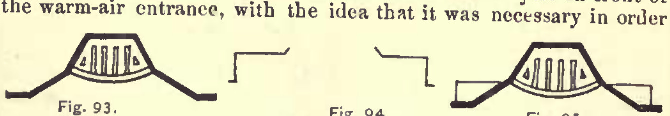


Fig. 93. Fig. 94. Fig. 95.
Lloyd's Tubular Fire-Place. From Tomlinson.

to deflect the current upwards as it entered, and thus prevent horizontal draughts. Such a deflector is, however, an unnecessary complication. The direction of the air current would be influenced chiefly by its gravity or temperature, and, if warmer than the air of the room, would rise at once to the ceiling; if colder, it would fall to the ground without much regard to the trifling impediment offered by the deflector. This would be as powerless to influence the general direction of the air current, as would be a stone at the bottom of a river to counteract the laws of gravity by which its course was determined. The action of this fire-place when first introduced is thus described by Mr. Lloyd: —

"The complete and agreeable change in the character of the air of the room was at once apparent to every one; and instead of the room being barely habitable in cold weather, it was found to be the most comfortable in the house. This stove was fixed at the latter end of December, 1850, and has been in use ever since without the slightest difficulty of management, and with entire satisfaction to the inmates of the house. During the first winter careful observations were made on its action, and the results are in many respects remarkable. Within an hour after the fire is lighted, the air issuing from the air-passages is found to be raised to a comfortable temperature; and it soon attains a heat of 80°, at which it can be maintained during the day with a moderate fire. The highest temperature that has been attained has been 95°, whilst the lowest on cold days, with only a small fire, has been 70°. The result of twenty observations gave the following temperatures: On two occasions the temperature was 95°; the fire was large, and the door of the room was left open so that the draught through the air-tubes was diminished; on five occasions the temperature was below 80°, averaging 75°; the remaining thirteen gave an average of 80°. The mean temperature of the room at the level of respiration was 61°, while the uniformity was so perfect that thermometers hanging on the three sides of the room rarely exhibited a greater difference than 1°, although two of the sides were external walls. As might be expected, there was no sensible draught from the door and window. On observing the relative temperatures of the inflowing and general air of the room, it appeared that there must be a regular current from the ceiling down to the lower part of the room, and thence to the fire. The inflowing current, being of a temperature nearly approximating to that of the body, was not easily detected by the hand; but on being tried by the flame of a candle it was observed to be very rapid, and to pursue a course nearly perpendicular towards the top of the room, widening as it ascended. It was also noticed that the odor of dinner was imperceptible in a remarkably short time after the meal was concluded. In order to trace the course of the air with some exactitude, various expedients were made use of. It was felt to be a matter of great interest to ascertain if possible the direction of air respired by the lungs. The smoke of a cigar, as discharged from the mouth, has probably a temperature about the same as respired air, higher rather than lower, and was therefore assumed to be a satisfactory indicator. On its being repeatedly tried, it was observed that the smoke did not ascend to any great height in the room, but tended to form itself into a filmy cloud at about three feet above the floor, at which level it maintained itself steadily, while it was gently wafted along the room to the fire-place. In order to get an abundant supply of visible smoke at a moderate temperature, a fumigator charged with cut brown paper was used. By this means a dense volume of smoke was obtained in a few seconds; and it conducted itself as in the last mentioned experiment. On discharging smoke into the *inflowing air current*, it was diffused so rapidly that its course could not be traced, but in a short time no smoke was observable in the room. Another experiment was made with a small balloon, charged with carburetted hydrogen gas, and balanced to the specific gravity of the air. On setting it at liberty near the air-opening, it was borne rapidly to the ceiling, near which it floated to one of the sides of the room, according to the part of the current in which it was set free; it then invariably descended slowly, and made its way with a gentle motion towards the fire. The air has always felt fresh and agreeable, however many continuous hours the room may have been occupied, or however numerous the occupants. It is difficult to estimate the velocity of the inflowing current; but if it be assumed to be ten feet per second, there would pass through the air-tubes in twelve minutes as much air as will equal the contents of the room. And as it appears that the air so admitted passes from the room in a continuous horizontal stream, carrying with it up the chimney vitiated air from the lamps or candles, and all vapors rising from the table, it is by no means surprising that the air should always be refreshing and healthful. Since this stove

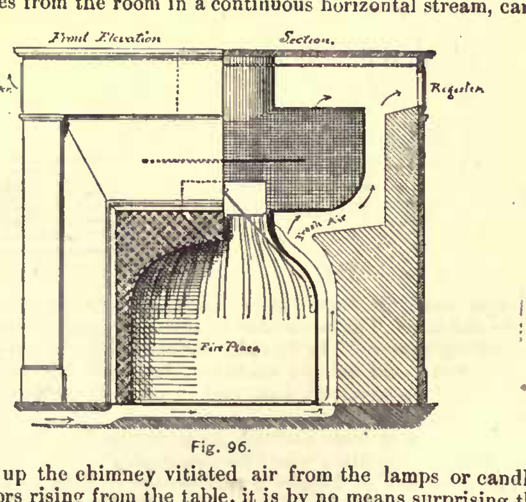
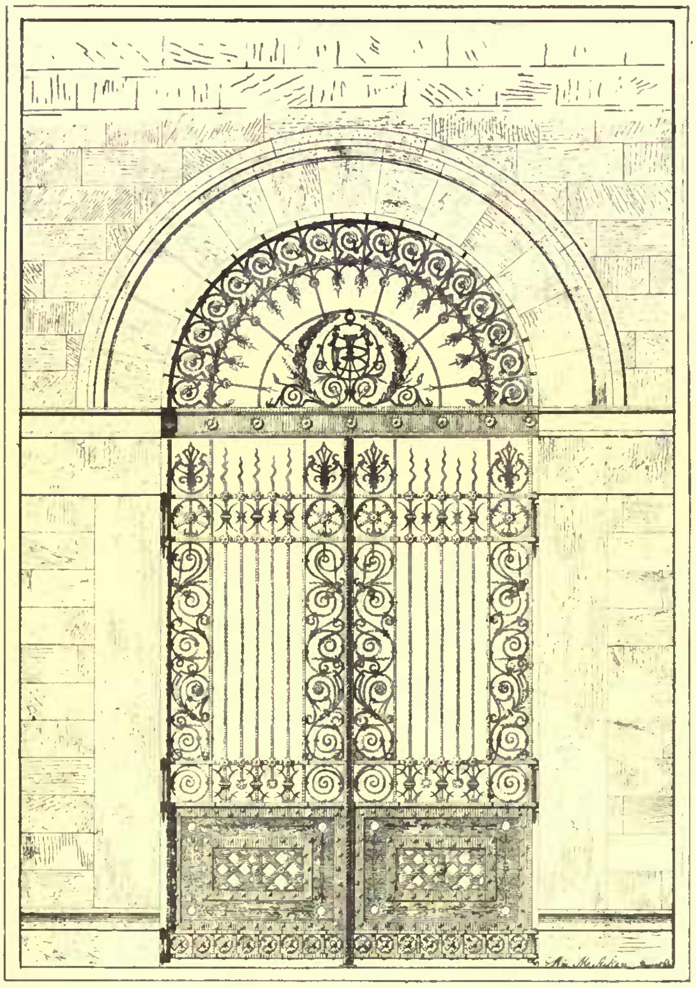
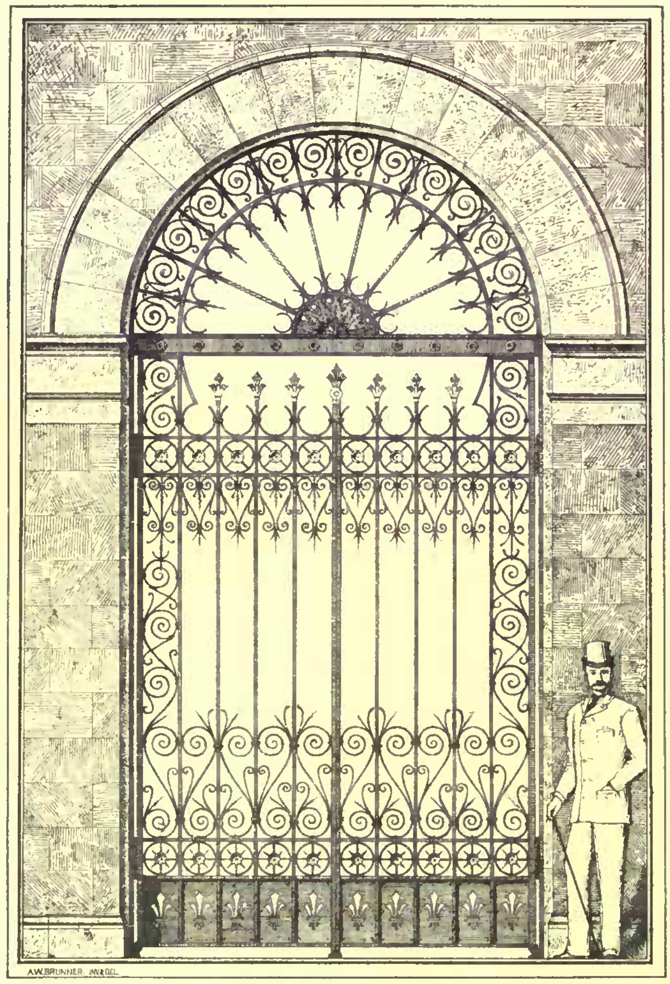
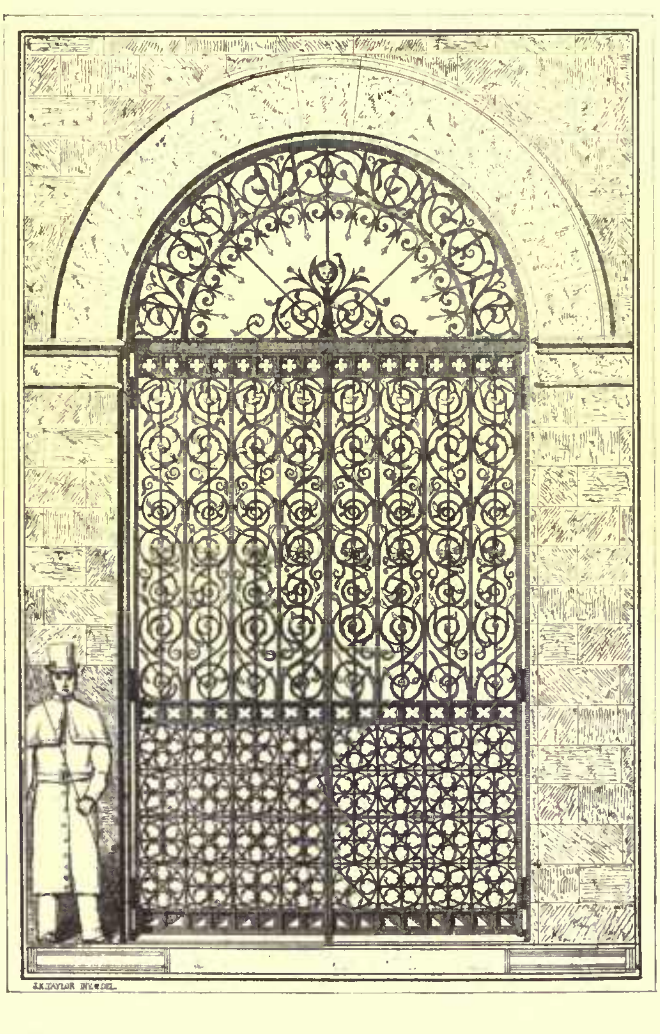


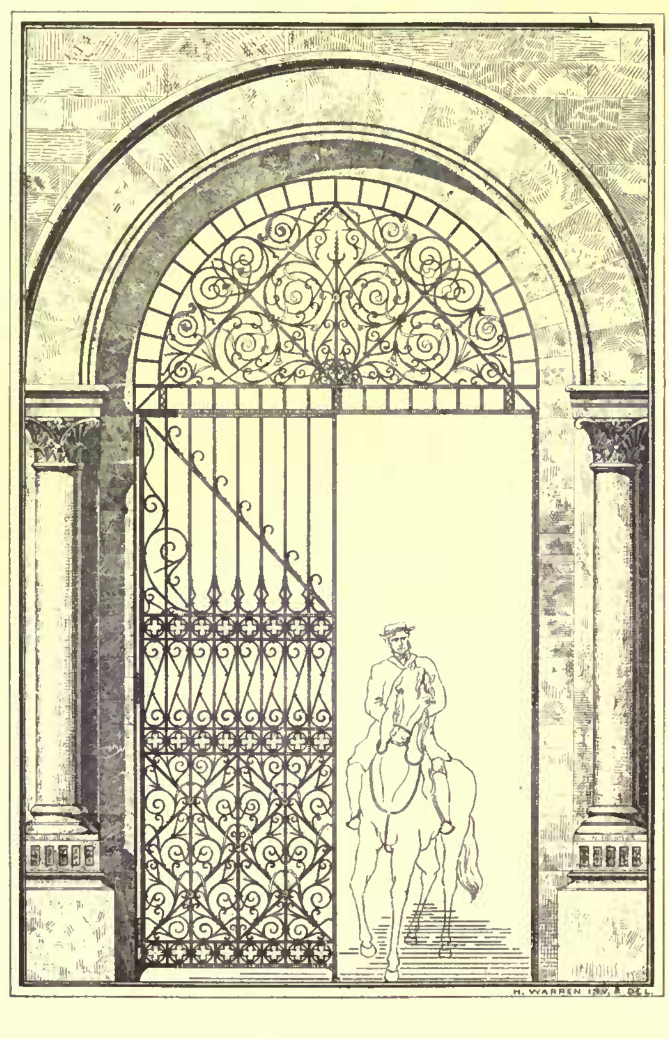
Fig. 96.



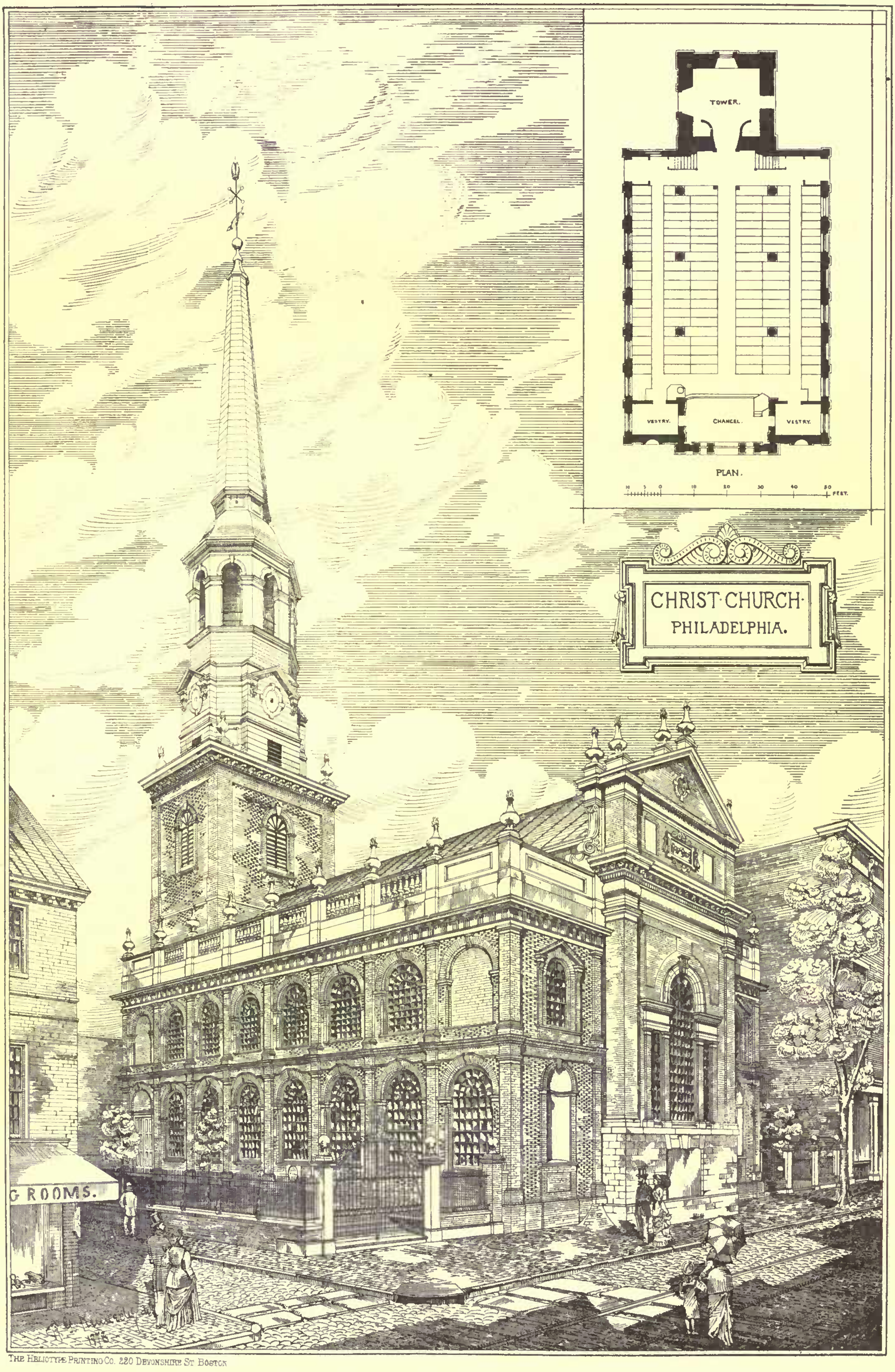


DESIGNS FOR A WROUGHT-IRON GATE

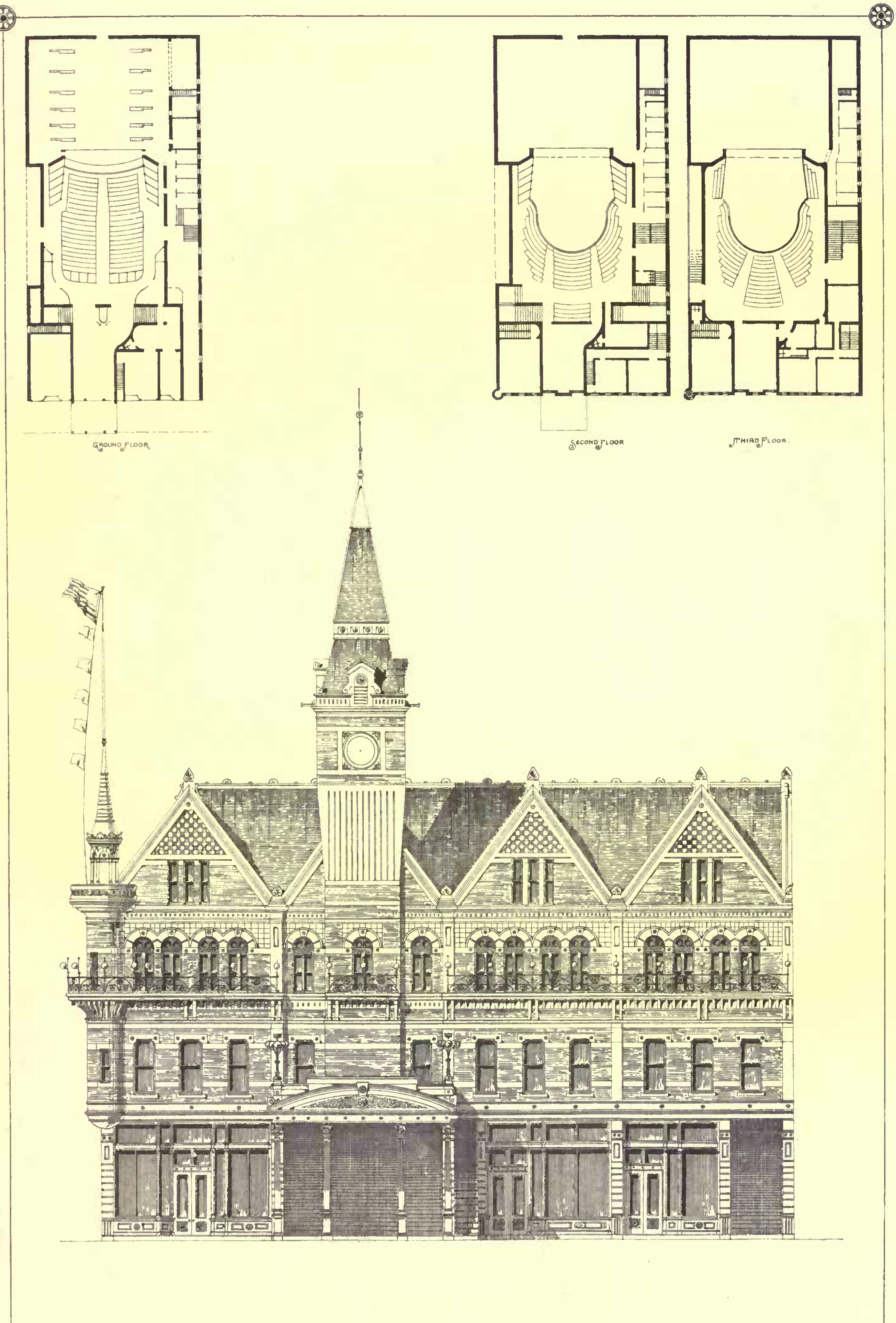




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has been fixed, others have elsewhere been fitted up on the same principle, and have been found to exhibit similar satisfactory results."[1]

We give in Figs. 96, 97, 98, 99, 100, and 101, plan, sections, and details of the fire-place of Joly. It is unquestionably one of the best of its kind known. It is easy to set, easy to repair or clean, and easy to manage; simple in construction, effective in action, unobjectionable in appearance, and equally suitable for any kind of fuel.

The fresh air enters under the hearth through a proper duct, and passes into the hot-air chamber behind the cast-iron shell forming the back of the fire-place. Within this shell are placed either andirons or a grate, according as wood or coal is to be burned. A frame and damper at the chimney throat regulate the size of the opening. The fresh air passes under, behind, around, and above the shell, and enters well heated through the registers at the right and left under the mantel. M. Joly has given ample room for the fresh air, in accordance with the correct principle of supplying an ample quantity of air warmed to a moderate degree, rather than a small quantity raised to a very high temperature, unduly dried and perhaps burned.

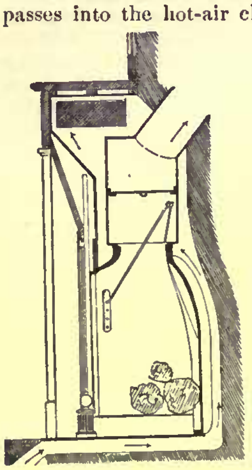


Fig. 100.

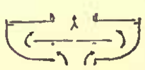


Fig. 97.

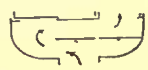


Fig. 98.

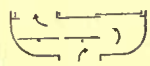


Fig. 99.

An ordinary sliding blower is attached to the front face of the fire-place, for the purpose of increasing the draught when desired. In order to utilize the heat of the smoke as far as possible, a drum is placed above, and by an ingenious arrangement of slides the smoke may be made to pass to the right or left at pleasure, or to suit the position of the brick flue, as shown in Figs. 98 and 99; or, again, it may be made to pass on both sides, as is shown in the uppermost cut.

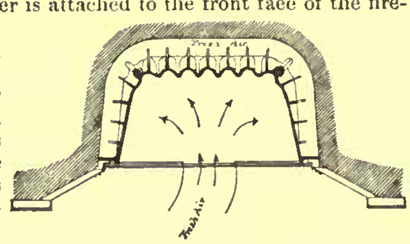


Fig. 101.

THE ILLUSTRATIONS.

PLANS OF THE ENGLISH HIGH AND LATIN SCHOOL-HOUSE, BOSTON, MASS. MR. G. A. CLOUGH, CITY ARCHITECT.

LOSING a working day last week by the intervention of Fast Day, we were prevented from rectifying a mistake in our last issue, and so were forced to publish the plans of this building at a smaller scale than we had intended: therefore we repeat them this week.

CHRIST CHURCH, PHILADELPHIA, PENN. DRAWN BY MR. R. G. KENNEDY, ARCHITECT, PHILADELPHIA.

This building possesses many points of historical interest, and as a specimen of colonial architecture is probably one of the most characteristic in this country. It exhibits in a marked degree the points belonging to that style with which we are now more or less familiar, under the designation of the Queen Anne. It is situated on the west side of Second Street, near Market Street, and has been fortunate in retaining its original appearance and a considerable amount of open space round it, in spite of the march of modern improvements. The church was founded in 1695, and the present edifice is the second built on the site, having replaced the earlier building, which was of timber. The tower was begun in 1727, the main building in 1731, and the spire was added about 1753–54. The design is attributed to Dr. Kearsly, who was also the designer of the State House. The building is about 60 by 90 feet and the tower is 28 feet square. The height from the ground to the top of the vane on the spire is nearly 197 feet. The materials used are chiefly brick and wood. The walls of the tower, however, are of stone faced with brick, and the pilaster caps and bases, the keystones of the arches, and the entablature and archivolts of the large east window are of brown stone. The cornice at the level of the gallery floor and some of the smaller cornices and mouldings are formed with moulded bricks. All the other cornices, the balustrade and the spire, are of wood, and are painted white. The interior is divided into nave and aisles by means of two rows of Roman Doric columns with elliptic arches over them, but presents little detail of interest. The tower contains a chime of eight bells, which were cast in England in 1754. Interesting accounts of the history of the church are to be found in Watson's Annals of Philadelphia and in Westcott's Historic Mansions of Philadelphia.

[1] Francis Lloyd's *Practical Remarks on the Warming, Ventilation, and Humidity of Rooms.* London, 1854.

PROPOSED LYCEUM AND THEATRE, ROCHESTER, N. Y. MR. HARVEY ELLIS, ARCHITECT, ROCHESTER.

Brick, stone, and tile are to be used for the exterior of this building which measures 98 by 186 feet, and whose estimated cost is $75,000.

FOUR DESIGNS FOR A WROUGHT-IRON GATE.

These gates were designed and drawn by Messrs. Wm. M. Aiken, of Charleston, S. C., A. W. Brunner, of New York, James K. Taylor, of St. Paul, Minn., and Herbert Warren, of Boston, special students in architecture at the Massachusetts Institute of Technology, in accordance with the following programme: —

Given an archway with a semicircular head, there is required a design for wrought-iron gates in two valves, each fifteen feet high and five feet wide, to close the opening up to the spring of the arch, and for a fixed grill to close the space above.

The constructive and decorative forms employed, and the articulations used, are to be such as are specially characteristic of the material.

These are the best four out of eight designs presented.

CORRESPONDENCE.

THE OUTLOOK FOR THE COMING SEASON.

NEW YORK.

THERE seems to be a general feeling that the opening season is to be a better one for the building interest than any since the dull times set in. It would not be just to say that this prospect is an assured one. There is much talk of work to be done. Turn which way you will, hopeful expressions are met, but as yet they are but hopes and have not taken the form of fixed contracts. At the Builders' Exchange one may hear on all sides of work most urgently talked about; owners are asking for estimates, while speculative builders are seeking bottom prices on material and labor. This is the first season that the factor of rapid-transit has come in to modify the usual annual problem, and it is beyond a doubt working favorably for the builders, even if it is doing next to nothing for the architects. The first demand in the upper districts of our long, narrow island city is for houses. These are growing up under thousands of busy hands, but on commonplace models, and as yet no effort is making to put up structures of importance, and until these are called for the better class of architects have but little immediate interest in the progress shown.

The recent discussion over the tenement-house problem has had the effect of stirring up capitalists, and already two sets of gentlemen are working away to seize the opportunity for supplying reasonable houses for the poor and securing good dividends for money invested. Should these gentlemen carry out their intentions, several hundred thousand dollars will soon be put into such buildings.

The Vanderbilt House and the New Union League Club House are not yet out of the architects' offices, but both of them will almost beyond a doubt be under way within a few days. The committee of the club have not yet chosen between the competitive plans, and Mr. Vanderbilt is in the curious predicament of one who has a house and is still looking for a lot to put it on. The valuable and excellently built house on the corner of Fifty-seventh Street and Fifth Avenue is to be taken down and rebuilt, and some delay has been experienced in finding a corner lot fit for its reception. This settled, operations, it is promised, will be entered upon at once.

Down town there are enough of improvements in progress to make travel inconvenient. The government Barge Office when started will be an important work; and the negotiations to secure a strip of land at the north end of the Post Office, if successful, will at once put a band of workmen on the new covered roadway which it is intended to build there. The Chamber of Commerce is ready to proceed at once with its task of putting up a new Exchange, when Congress shall have ratified the transfer of the old Post Office site. Many of these larger works, it will be observed, are things of probability, rather than works assured, and it would be unfair to reckon them in the estimate of the season's work.

What will be done in that peculiar district lying north of Fifty-ninth Street and west of the Park it is difficult to say. With the finest views, the healthiest location, the most desirable surroundings, the best appointed roads, this region is yet a desert, so far as humanity is concerned. Now that rapid-transit is pushing up into it a move may be made, but it is not the side where activity and push is looked for. In the eastern up-town section of the city there is an unprecedented activity in building operations. This is a district where more than in any other part of the city away from the City Hall and heart of the town there was an effort to push despite the lack of rapid-transit. Now that rapid-transit has come along the east side avenues, there is a rush among the owners of real estate there and investors of money, to be first in the field to enjoy the profits which must accrue when the influx of tenants becomes great.

The partition suit of the Rhinelander estate, covering a tract from Eighty-sixth to Ninety-third Street and running off to the East River from Lexington Avenue, will throw a number of building lots into the market at a convenient point. The heirs will naturally set about the improvement of the property. The favorite style seems

to be a building of sixteen feet front, which will rent at about $600 per year.

There is manifested in various ways a great desire on the part of persons now residing in Jersey City and Brooklyn, to come in and reside within the city limits so as to enjoy the benefits which come from the Elevated Railroad service.

A tour through the east side above Sixtieth Street carries the wanderer through a busy section. Not only on solitary buildings, but on rows here and there, mechanics are busy. Early in the winter many of these houses were commenced and every effort is making to put them in order for spring letting. They are not mushroom houses, by any means, but are fairly built, though nowhere are any buildings of any particular architectural merit to be seen. The land is not as a rule very dear, and the demand for moderate rentals has been so great that on all sides the effort seems making to meet it. The builders are offering their houses at very low rates and on the most favorable terms. In some cases the instalment plan is resorted to, purchasers paying down so much a month until the whole sum is paid, after which a deed is given.

Arnold, Constable & Co. hold a large property between Seventieth and Eightieth Streets, near Fourth Avenue, and here a better class of houses is under construction, indicating that the line of first class houses is to hold its own on the eastern flank of the Central Park. On the river front the demand for yards and docking privileges will compel owners to improve what has thus far remained a wild rocky frontage. W.

THE OUTLOOK. — PROFESSIONAL VAGARIES.

CINCINNATI, O.

THE building interests of Cincinnati have for several years past been going from bad to worse, until it does seem as though matters were almost at a crisis. The business is totally demoralized; men are distrustful of each other; no one is making any money, or at least this is the claim of all. One of our most prominent iron manufacturers told your correspondent recently that he had been accustomed to charge up among his expenses shop-rent (he owns a very large factory), but this he had not done for three years past. No money in the business, he says.

Contractors are bidding in a wild and unseemly manner, and we cite as our proof the instance of a prominent builder who was the highest bidder for the carpenter-work of the Exposition buildings: this same man bid as much too low on the carpenter-work of the Wiggin's building as he was too high on the other; so low was he, in fact, on the latter building that the owner, although he had invited him to estimate on the work, nevertheless rejected the bid as being too low, and gave the work to the third lowest bidder. This leads us to inquire why, if the owner knows so well just what the carpentry, or any other work on a building, is worth, should he take the time of the builders in giving him information? An owner has only at the present time to indicate about how much he desires to expend upon any contemplated improvement, to find many eager and willing victims, ready and anxious to undertake and perform impossible things. This unseemly state of affairs extends beyond the building fraternity, even into the architectural ranks; for it was only the other day that a well-known and wealthy Hebrew called upon several architects and sold to the highest (or lowest) bidder, as it were, the making-up of the plans and specifications for a dwelling-house which will cost, perhaps, $25,000. It is a burning shame that this person was so far encouraged by architects as to actually receive proposals ranging from $75 to $300. We do not censure him for getting his work done as low as possible, for he does not know what a full and complete set of drawings is really worth, but the architect *is* to blame who will hawk his profession through the streets and degrade and belittle it in the public mind in such a manner.

All this goes to show that business is not as good as it might be, or there would not be such rush and greed. C.

THE OUTLOOK. — THE BUILDING AND THE PROVISION MARKETS.

MILWAUKEE.

AN experience of over twenty-five years of the causes that promote and retard the operation of building in this city warns me not to be too positive in making assertions as to the prospects for the coming season.

While there is a certainty that a larger amount of heavy buildings than usual will be built this season, and consequently an unusual demand for the less skilful among the mechanics, there is not much prospect at present that there will be many first-class buildings erected for either commercial or domestic purposes. The new grain elevator for Mr. Smith, the round-house and shops of the Chicago, Milwaukee & St. Paul Railway Co., and the large addition to the packing houses of Plankinton, Armour & Co , for all of which a beginning is already made, will give employment to large numbers of what are called "rough hands."

The County Asylum for the Insane, which is to be finished this season, will require quite a force of mechanics of a somewhat better class than the above. The new Chamber of Commerce will employ a great many of the very best of mechanics, as the intention is to make the building first-class in all respects. Only the last two of these buildings will give employment to architects, and to the builders who usually do the work from plans prepared by architects, so that these must look to other sources for employment. At present, there does not appear to be any demand for stores or dwellings. Of course, some improvements are always being made in the building season.

The activity of the provision market and the price of wheat and pork materially affect all business here, and they particularly affect the building business. This is easily conceived when it is known that with grain and pork we make all our exchanges. If, then, the price of wheat keeps up, and pork continues to advance, as it is likely to do, we may expect there will be considerable activity in building this season. If the prices of these commodities decline, a dull season is almost certain. At present mechanics and laborers are better employed than at the corresponding period last year. A. B.

THE ITALIAN SCHOOL OF SCULPTURE.

IN every country where sculpture is practised with more or less success, it is, as in France, appropriated almost exclusively to the decoration of public buildings. Italy alone is the exception. Whether it is because of her marble quarries, or because of some especial taste of her children, Italy has been successful in giving to sculpture a place in home life. This is what has given Italian sculpture a peculiar individuality. Its good qualities and its defects are its own and are not found elsewhere, at least in the same degree. If all the statues which were exhibited at the late exhibition should be brought together in the same gallery, it would be very difficult to distinguish the French, the English, the German, and the Belgian, one from another; they all seem to belong to the same school. Italy stands apart. There is an Italian school of sculpture; we may like it or dislike it, but it is impossible to confound its works with the works of other countries.

When sculpture is dedicated to the decoration of buildings, promenades, and public places alone, it must before all things study simplicity of line, largeness of form, nobility of style. But if sculpture is to find a place in our homes, and be admitted to our intimacy, it must interest us by the truthful representation of the familiar aspects of every-day life. There are dangers on both sides: in striving after grandeur of style one may only attain rigidity and emphasis; in pursuit of realism, there is danger of falling into ugliness and triviality. The art of the ancients has left us admirable models which our sculptors have good reason for studying, not as a substitute for nature, but for the sake of preparing themselves to understand and interpret her; although it is difficult to refrain from copying what we admire. Modern sculpture is often accused of giving us only imitations of Greek art, which we do not want, for there is no need of repeating what is already done and well done. It is worthy of note that Italian sculpture alone is not subject to this reproach; there are more antique statues in Italy than in all the rest of Europe; it is there our artists go to study: yet one would say that, as far as the Italians are concerned, Greek art had never existed, or that they deliberately closed their eyes in order not to see it. Their faults are precisely those which, seemingly, the study of antique art would easily cure.

I have said that Italian sculpture has its good and bad points; its good qualities are very real, and the French critic is wrong to overlook them. The little statues, in fine semi-transparent marble, scattered with such skill here and there through the Italian section, are generally full of life; the motions are natural, the draperies are light and pliable, the mouths smile, the eyes sparkle, the hair flutters in the wind, but — for there is a but — they are pretty rather than beautiful; they are often somewhat commonplace, and almost always *maniéré*. The dexterity of execution is marvellous, but this deftness of the hand seems to find its gratification in the very secondary merit of having overcome a difficulty. The rendering of the details, the finish of the accessories, the polish of the jewels, the texture of the drapery, the elaborating of flowers and lace, all this tickles the palate of the Philistines and the learned in fine clothes, but are these the suffrages which ought to excite the ambition of an artist? The Italian sculptors might reply: "We seek to please those who buy our statues, as you strive to satisfy your subscribers; we know as well as you, that this rendering of accessories is a small affair, from the point of view of true art: but that which is important is the expression of life, and since you find this precious quality in Italian sculpture, you are wrong to complain that these other things are thrown in." But these same other things engross the attention altogether too much; one no longer thinks of looking at the face. Surely it is not in their museums that the Italians have learned to practise all these trivialities. Have they never seen the torso of the Belvidere, which the blind Michael Angelo caressed with his aged hands? or, if they insist on keeping to *genre* sculpture, why do they not look at the boy with the goose, or the boy with the thorn? That would show them that archness is not grace and that prettiness is not beauty.

For several years past a violent reaction is making against this abuse of prettiness which is the grievous transmittendum of Canova. There were at the Exhibition some Italian statues of a realism so unbridled that by their side Millet's peasants would seem to have stepped out of fashion plates: a little Neapolitan fisher-boy, more hideous than all the monkeys in the world, which Sig. Genito exhibited at the Salon of 1877; two Parasites, by Sig. Orsi, whose hands looked like the paws of a gorilla; Cain and his wife, whom Sig. Amendola, a believer in Darwin's theory, as it seems, represents in the form of an

anthropoidal ape, with his mate, a pouched monkey of the land of Nod. The nails of these two personages, as they lived before the Stone Age, have grown into interminable claws. There was also a large painted terra cotta by Sig. Michetti, representing a dead peasant woman with an infant still sucking at her breast. The cheeks of the poor woman were bloated and the mouth horribly contracted. What Sig. Gatti styles, I know not why, an Impression of Pompeiian Times, is only a cruel street-boy showing a poor mouse to a cat; finally, let us not forget the Quarrel of Sig. Ximenes, two tatterdemalions, who are fighting and making horrible faces at one another.

One sees that the Italian realists stop at nothing. In this ugliness, it seems to protest against the many pretty cherubim of a past time; but in art as in everything else it is necessary to guard against excessive reactions; beautiful models are as real as ugly ones, and it would have been easy to make a better choice. The Greeks who consecrated statues of the athletes in the sacred wood of Olympia would not have understood how an artist could make up his mind to immortalize in bronze or in marble the most defective types of humanity.

The systematic search after ugliness can be explained by a comic motive. Thus it is difficult to stop without laughter before Sig. Focardi's Dirty Boy, whose mother holds him by the ear while she washes him. But this at least is only a statuette, while the two newsboys, by the same artist, hustling one another as they hasten to a purchaser, while they are as full of life as they are ugly, are a mistake in that they are life size. This is not the province of caricature; thus the Guapo Napolitano, which Sig. Jerace shows us twice, once large and once small, is much more acceptable in the small size.

The Italian realists do not seek comic expression alone, they sometimes attack dramatic expression. See, for example, the bronze and marble head of Othello, by Sig. Calvi; the group of Canaris on his fire-ship, with another Greek sailor, by Sig. Civiletti, and especially the dying Mozart, by Sig. Carnieto, a work the more dramatic that the expression does not lie in the features alone, but in the attitude of the whole body, from which life is ebbing; in the emaciated hands, which trace on music-paper the unfinished score. There is a still more astonishing *tour de force* in the statue of Jacopo Ortis, by Sig. Ferrari, for the head is entirely hidden in the pillow, so that the expression of poignant sorrow is shown only by the violent tension of the whole body.

Thus the Italian sculptors follow very different courses: some strive for grace, others for reality, others again for expression, but all alike are preoccupied, before everything, with giving to their marble movement and life. In spite of its faults, which I have not attempted to extenuate, this school has a merit which cannot be denied it. It belongs to our own time. Everywhere else sculpture seems to be a retrospective art. — *Louis Ménard in L'Art.*

AMERICAN INSTITUTE OF ARCHITECTS.

BOSTON CHAPTER.

AT the regular meeting of this Chapter, held in the Architectural Library of the Massachusetts Institute of Technology, on the evening of April 4, President Cabot in the chair, the report of the committee appointed with the object of obtaining a permanent record of the old colonial remains of New England, now rapidly disappearing, was discussed and the following scheme was finally adopted: —

The Boston Chapter of the A. I. A., with a view to stimulating archæological research and the preservation of a record of colonial work in New England, invites the preparation of drawings illustrating such work as may have come down to us from the early years of our country, and which still exists in the New England States.

It is proposed that the drawings be submitted, for judgment as to excellence of rendering and interest and historic value of subject chosen, to a committee of three appointed by the Chapter.

To the authors of the best three drawings, or sets of drawings, will be awarded the following books as prizes, duly inscribed, namely: —

First Prize: "Art in the House," by Jacob von Falke.
Second Prize: "Etchers and Etchings," by P. G. Hamerton.
Third Prize: "Discourses on Architecture," by M. Viollet-le-Duc.
Or any other books of equal value which may be preferred

To such other drawings as may be deemed worthy, honorable mention will be accorded, and a certificate of the same will be given, signed by the President of the Chapter and the committee of judges.

The following suggestions, rules and conditions are added: —

SUBJECTS.

First. Buildings erected in colonial times, or during the early years of the Republic.

The drawings are to consist of measured drawings of plans and elevations, together with details to larger scale of the portions most interesting in an artistic point of view, and also a pen-and-ink perspective.

Second. Portions of buildings otherwise interesting, such as staircases, mantels, cupolas, wainscoting, buffets, windows, doors, etc., drawn to scale, with dimensions and perspective sketches of same.

Third. Old furniture, lockers, etc., illustrated as above.

TIME.

The drawings are to be forwarded to the Secretary of the Boston Chapter, post or express paid, on or before October 15, 1879, and will be returned by him to the owners on or before January 1, 1880.

In adjudging prizes, preference will be given to subjects not heretofore illustrated or published.

METHOD.

The drawings should *not* be framed.

They must be made upon sheets of Bristol board or Whatman's hot-pressed paper, size 14″ x 22″, including margins.

Only line drawings (pen and ink), made with black ink, will be received. No washes or stump-work is admissible.

DISPOSITION OF THE DRAWINGS.

If the drawings presented are sufficient in number and interest, it is proposed, subsequent to the award of prizes, to place the whole collection upon public exhibition, with the names of the successful competitors and award of prizes attached to the premiated drawings.

Further, if circumstances warrant, it is proposed to publish heliotype or other reproductions of the premiated drawings, and also of those to which honorable mention shall have been accorded, and if this course is found practicable, a copy of the book will be presented to each contributor represented therein.

This competition is open to all, and it is hoped that during the coming summer vacations much of interest may be brought to light and preserved. It is very important that each drawing be supplemented with an account, made as accurate as may be, noting *date* of construction, builder or designer, and any other historical facts which may be available or of interest.

W. G. PRESTON,
WM. R. WARE, } *Committee.*
R. S. PEABODY,

Mr. T. M. Clark was added to the committee having in charge the architectural department of the approaching exhibition of contemporary art in the Boston Museum of Fine Arts; and the committee was authorized to make further additions to its members, as they might find it expedient.

A circular addressed to architects by a firm of dealers in an article called "Asbestos Mixed Paints," offering "liberal commissions" if they would recommend or use it, was laid before the meeting, and the secretary was instructed to prepare and print a letter to the following effect, and to forward it to any manufacturer or tradesman hereafter guilty of making such offensive propositions to the profession in this neighborhood: —

Gentlemen, — The secretary of the Boston Chapter of the American Institute of Architects has been instructed to forward to all tradesmen and manufacturers, who may be reported to him as offering publicly or privately compensation in any form to architects if they would recommend or use their wares, a notice quoting the third section of the fourth article of the constitution of the American Institute of Architects, and informing them that in accordance therewith, and with the obvious proprieties of practice, the profession cannot entertain such propositions; that they are regarded among architects who value their good name as a reflection upon their honor; and that when made to them they must be compelled, in their own defence, systematically to avoid the use of all wares so advertised.

The article of the constitution above referred to is as follows: —

"No member shall accept direct or indirect compensation for services rendered in the practice of his profession, other than the fees received from his client."

Very respectfully yours, *Secretary.*

Mr. John A. Fox, a Fellow of the Chapter, then read a paper on the Construction of Small Theatres. It was illustrated by numerous working-drawings, and by a large collection of photographs and prints, bearing upon the subject. The characteristics of our local requirements in buildings of this character were fully explained, and the various details for accommodation and comfort both before and behind the curtain, especially as regards seating, ventilation, heating, safety from fire and panic, decoration, and machinery, were treated in a very comprehensive manner.

After a full discussion and a cordial vote of thanks the meeting adjourned. HENRY VAN BRUNT, *Secretary.*

A NOTEWORTHY COMPETITION.

ALBANY, April 4, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — Your issue of March 22 contained an item showing how much "architects are esteemed in the West." The inclosed correspondence will indicate a still worse state of affairs in New York.

Yours truly, O. & W.

HERKIMER, N. Y., April 2, 1879.

MESSRS. —— & ——:

Gentlemen, — I just purchased a lot, and shall build house during summer, not to cost over $2,500. Please inform me if you would send me plan in competition with other architects, and the one I adopt I pay for; also say what would be your price — can't pay fancy prices. Please let me hear from you, and if favorable, will send situation of lot with size and the number of rooms, etc.

Very truly.

ALBANY, N. Y., April 4, 1879.

MR. ——:

Sir, — Your esteemed favor of the 2d is received.

Accept our thanks for the compliment of having been included in the list of architects, from whom you have solicited plans for house.

As we must decline, and you don't limit the number of the profession you wish to compete, we have forwarded your letter to the *American Architect*, and hope the publication of it may benefit you.

Yours truly, O. & W.

TUBULAR PILES. — A method for putting down tubular piles has been devised by Messrs. Le Grand and Sutcliffe, of London. The piles consist of cast or wrought iron tubes, having a solid point, the upper part of which, inside the tube, is flat. The piles are driven in by means of a "monkey," raised and dropped within the tube, which therefore serves at the same time as a guide. Additional lengths of pipe can be screwed on by strong barrel-shaped steel sockets as the pile is driven.

PUBLICATIONS RECEIVED.

First Annual Report of the Commission of Health of Milwaukee. (Twelfth Annual Report of the Department.) January, 1879.

Rhymes of Science, Wise and Otherwise. With Illustrations. New York: Industrial Publication Company. 1879.

Annual Report of the Supervising Architect, to the Secretary of the Treasury, for the year 1878. Washington: Government Printing Office. 1878.

NOTES OF EXPERIENCE AND INEXPERIENCE.

11. Wind Pressure. — Noticing in the daily papers of last week that the velocity of the wind as recorded at the signal station on Mt. Washington, N. H., on Tuesday, April 1, was 182 miles per hour, while on Thursday of the same week it varied between 138 and 144 miles per hour, reminds me that no one has replied to the question of "Wind-Gauge," as to what pressure corresponds to different velocities of the wind. The velocities above mentioned are, I believe, unprecedented. Up to 1860, 90 miles per hour was the highest velocity recorded in England, and this was calculated to have exerted a pressure of 40 pounds per square foot of surface. The East Indian cyclones are supposed to move at the rate of only 100 miles an hour, and, according to Smeaton's tables, exert a pressure of about 50 pounds per square foot. The pressure is supposed to vary nearly as the square of the velocity, and Smeaton assumes that to find the pressure in pounds per square foot it is necessary to divide the square of the velocity in miles by 200. According to this, the highest velocity of the wind during the past week exerted the enormous pressure of 165 pounds per square foot. It seems incredible that any instrument could be strong enough to withstand the strain of such a pressure; for the wind-gauge of Girard College broke under a strain of only 42 pounds per square foot, exerted by a tornado passing within a quarter of a mile, this pressure corresponding to a velocity of between 90 and 100 miles per hour. All this is on the supposition that the surface is at right angles to the direction of the wind. Tredgold recommends an allowance of 40 pounds per square foot for sloping roofs, while Trautwine thinks the 40 pounds is sufficient to allow for the weight of the roof and the pressure of wind and snow; the coefficient of safety being 3 in each case. To conclude, a hardly susceptible motion is produced by a velocity of one mile per hour. Twelve miles produce a fresh breeze, 30 miles a strong wind, 50 miles a storm, 80 miles a hurricane, and 100 miles a cyclone. W.

16. Terne Plate. — Your correspondent "Roofer" asking the question "What is the difference between tin plate and terne plate?" is correctly answered by "C." in most respects. But experience in the use of these materials for roofing purposes differs according to localities. Whether the lead coat be thicker than the tin coat or not, it is certain that terne plate is cheaper, and for this reason roofers always try to put it on when the architect does not know the difference. Terne plates were once used in this city (Chicago), to a considerable extent, but their destruction by the products of coal smoke, with which this city is infested, has led to the almost universal employment of tar and gravel roofs. Bright tin is much more enduring in this locality, and I have used it with great success on buildings in which it has remained perfect for six years, with a good coating of metallic paint. Terne plates are universally called "Roofing Tin" in this market; hence so many have been led to think they are the only grade proper for roofs. Their failure has been such that architects have lost faith in tin altogether, while if they had specified bright X tin their roofs would have resisted the atmospheric influences. From experience I consider this grade of tin to be still the best available roofing material for this city. P. B. W.

17. Smoked Ceilings. — I have noticed a phenomenon which, apparently, has some connection with the porosity of plaster, and would like to know the reason of what I have noted on the ceiling of a room which has been badly covered with smoke, with this result: the position of each ceiling joist and lath is shown clearly, because the smoke has settled most densely on the portions which correspond to the spaces between the laths and joists; but the lightest portions do not correspond to the position of the laths, which the plaster actually touches, but are under the ceiling joists. This interferes with the conclusion one would naturally draw, viz., that the plaster being porous, the draught from the heated room into the floor spaces above was most active where both sides of the plastering were exposed only to air, and the soot was deposited in greatest quantity where the filtering went on most rapidly. But if this solution is the true one, then the lightest places should be where there is no draught, that is, under the laths. Can any one suggest a better explanation? Lath and Plaster.

NOTES AND CLIPPINGS.

An Insecure Foundation. — Mr. Thomas W. Wright lately presented a petition to the Common Council of Philadelphia, praying to be relieved from fulfilling the contract to build a school-house on Fourth Street, of that city, which had been awarded to him. His statement was that he found that the site was underlaid by a bed of quicksand, so that an ordinary foundation could not be laid, and his contract did not call for piles. It is said that workmen had tried to build a well on the site, but found that the portion of the brick lining which they laid one day had sunk out of sight when they returned to their work on the following morning.

Egyptian Locks. — Up to the latter half of last century we had not reached to the excellence of the locks that were in use in Egypt and China thousands of years ago, and have not for a very long period run in the line of rediscovery or reapplication of what had been tested so long ago in them. The essential principle of the Egyptian locks was movable pins or nails, dropping, each independently, by its own weight, into the bolt, and securing it on being touched at the right by corresponding pins at the end of the true key; all of them requiring to be raised together to the proper height. The very latest ideas in lock making may be regarded as suggestions or applications of this principle. — *Good Words.*

Another Mistake of the Anti-Restorationists. — The Anti-Restoration Society has once more brought upon itself both a sharp rebuke and a certain amount of disgrace, by writing to the Dean of Norwich Cathedral a rather intemperate letter of remonstrance on his supposed intention of decorating the interior of the cathedral with color. It seems that some forty or fifty years ago, the then Dean had the interior yellow-washed from top to bottom. This unsightly finish the present Dean is having scraped off, largely at his personal expense. One day the workmen came across a trace of color, and by much careful work succeeded in laying bare quite a large sized patch of color decoration, which is to be carefully preserved as being of archæological interest. Noticing it one day, some busybody, or possibly some practical joker, wrote to the secretary of the society, Mr. Morris, and besought him to put a stop to the profanation of coloring the interior. Without stopping to make inquiries Mr. Morris wrote, as requested, and has now probably learned not to be so precipitate in the future.

Painters and Monuments. — It is said that painters are to take part in the competition for the monument to the memory of Victor Emanuel, which is to be erected at Rome.

Electrography. — We printed some time since a rather unintelligible account of a voltaic pencil, copied from the Detroit *Free Press.* The following account, taken from *Le Technologiste,* is more satisfactory. "It is to M. Bellet, a Parisian, that we owe the invention of the voltaic pencil, which perforates the paper in the same manner that it is pierced by Edison's electric pen, but without the intervention of the needle vibrated by a little electro-motor. Instead of actuating a needle as in the ordinary pricking machines used by those who design laces, embroideries, etc., the electric current itself passes through the paper, for, as is well known, the lead of a pencil is a good conductor. This arrangement is advantageous in that the artist sees the traces of his work, his method of working being in no way different from the one which he habitually uses. But more than this, by means of this voltaic pencil, so skilfully perfected by its inventor, the artist, by drawing directly upon the lithographic stone or the metal plate, can now dispense with the services of the engraver, who so often denaturalizes the artist's work. M. Bellet, encouraged by his first success, has taken out patents in every country, and a company has been formed which will be able to provide a series of apparatus by which a person wholly ignorant of the properties of electricity can reproduce almost instantaneously the most delicate and complicated designs. By the means of slight modifications the apparatus will produce pounce patterns similar to those produced by Edison's pen, lithographs on stone, etchings, and finally stereotype plates. The inventor imagines that this invention will produce a revolution in the manner of illustrating books and papers."

The Architect of Westminster Abbey, Mr. John Pearson, has been appointed to the office of architect and surveyor to Westminster Abbey, as successor of the late Sir Gilbert Scott.

How English Work is done by Foreigners — Mr. John Burns of the Cunard Company, in a letter to the Provost of Glasgow, points out a reason why there is distress in that city. His company is fitting up a new steamship called the Gallia, and on Saturday the Belgian work-people, who were laying down parquetry on the cabin floor, instead of leaving at one o'clock, as Scotch or Englishmen would have done, asked permission to go on till dark so as to finish their job: "The entire panelling of the Gallia's cabin has been executed by Japanese carpenters, and the iron-work of the office in which I now sit was made in Belgium. Instance after instance could be given of how all nations are competing with us, not only as regards the manufacture of articles used in their respective countries, — hitherto to a great extent supplied by Britain, — but the artificers of foreign countries are, in spite of us, advancing into our own country, and compelling us to employ them, simply because they can do our work as well and much cheaper than it can be done by our own workmen. What does this bring us to but that the arbitrary curtailment of the hours of labor is a delusion and snare to our working classes, and the sooner they cast to the winds the doctrine of those who are imposing on them, the better for themselves? That doctrine tells the working-man that he should not work longer than fifty-one hours in the week. That doctrine is nuts for the foreigner to crack, and is ruining our country and our countrymen." — *Building News.*

Tell's Chapel. — It is explained that "Tell's Chapel," on the Bay of Uri, to whose demolition there has been some little opposition, is to be taken down, because it is in danger of falling to pieces, and that it will be rebuilt in its original form and dimensions.

An Album of Architectural Photographs. — The Minister of Public Instruction in Italy has begun the publication of an immense album of photographs of the architectural remains of the Middle Ages, in Italy. The parts of the series for Florence, Sienna, Arezzo, Pisa, and Lucca are already issued, and others will follow soon. The anti-restorationists will not be pleased to learn that this enterprise is connected with the plans which the government entertains for restoring and preserving these interesting buildings, although the details are not yet definitely decided.

A Correggio. — A sketch in distemper on wood has lately come to light at Rome, which apparently was Correggio's first sketch for his famous Christ on the Mount of Olives, which now hangs in the gallery of the Duke of Wellington. The date is marked on the back of the panel, and the marks correspond with Vasari's description of it.

Dry Coating for Basement Walls. — Take fifty pounds pitch, thirty pounds resin, six pounds English red, and twelve pounds brick-dust. Boil these ingredients and mix them thoroughly; then add about one fourth the volume of oil of turpentine, or enough to flow easily, so that a thin coating may be laid on with a whitewash or paint brush. Walls thus coated are proof against dampness. — *Der Techniker.*

The American Architect and Building News.

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BOSTON, APRIL 19, 1879.

CONTENTS.

Seven years ago Congress authorized prizes to the amount of $5,000 to be awarded to plans for a new national library. More than twenty designs were submitted in this competition, and the due rewards were bestowed; but nothing more was done. Two years ago a commission was appointed, composed of members of both Houses of Congress and others, to inquire into the best mode of providing accommodations for the library, either inside or outside the Capitol. This commission, after having industriously investigated the subject and consulted many architects, reported that although it was earnestly desired to keep the library within the Capitol, and although several plans for accomplishing that object had been submitted and considered, "the commission unanimously concluded that no such plan was practicable," and that the library, as enlarged, could not be made a part of the Capitol without defacing it. A separate building was consequently proposed. No action was then taken upon this report. And now the matter has again come up, and it has been referred to another commission or committee; but from the resolution under which this body is to act the majority of the Senate has voted to exclude the wise decision of the previous commission, and the new commission is expressly confined to the consideration of a library within the Capitol. An amendment was proposed requiring that the "practical changes" should be such as could be made "without serious injury to the architectural effect of the building." But even this obviously proper and civilized suggestion was curtly rejected, and the committee now seems to have before it the difficult task of providing such an addition to the completed structure as shall afford new accommodation to the two legislative chambers, and give room and verge enough for a national library of a million volumes, more or less, and for the spacious conveniences required by its administration. Senator Morrill, of Vermont, in an excellent speech upon this subject, delivered on the 31st of March, interpreted this action of the majority either as an indirect proposition for a new Capitol, or as a postponement of the important and necessarily importunate question of a new library until a more convenient season.

The Senator from Vermont stigmatized the proposition of the majority of Congress to make these fundamental alterations and incongruous additions to the national Capitol as perhaps the greatest blunder now in process of incubation among civilized peoples. "Whenever any acute and fertile genius," he said, "feeling himself equal to the great emergency, shall have brought forth a plan for an addition to the Capitol of such dimensions as will be required for a new chamber here and a new hall in the other end of the Capitol, and be also sufficient for the future requirements of the library of Congress, conducted in accordance with the provisions of existing laws, I feel sure that it will be nothing else than a huge excrescence upon whatever there is of simplicity and grandeur, or of classic beauty, in the present appearance of the Capitol." The proposition for the increased accommodation has taken various forms; the one which finds greatest favor seems to be the extension of the flanking pavilions of the west front on a lower level, as we have lately described (*American Architect*, February 22). It is also proposed to offer room for a new and larger library by extending the central portion of the eastern front indefinitely towards the rising sun. It is further suggested that the two legislative chambers being housed in the two new western wings, where they may have direct access to exterior light and air, the present chambers may be readily adapted to the uses of the library. It will thus be seen that the most important question of a new library is for the moment hopelessly entangled with other propositions, and that there is a fair chance that out of the muddle there may emerge an architectural blunder of the most colossal kind.

The requirements for the accommodation of a great library like that of Congress, it being more properly a national library, with annual accretions amounting to forty or fifty thousand volumes, are of a nature not to be satisfactorily met by any make-shift or adaptation whatsoever. Experience has shown that for the proper administration of such a great public trust it is necessary, first, to provide vast fire-proof store-houses with abundant light and equal temperature, so arranged as to accommodate the books with the utmost economy as regards space, and to facilitate their scientific arrangement, their accessibility, and their capacity for enlargement in any single department of literature without trenching upon the domain of other departments; second, to give to the librarian and his assistants a position from which all these points of storage are as nearly as possible equally accessible; third, to supply public reading and study rooms with reference libraries amply lighted and properly aired; fourth, to give ample accommodation to the most essential department of bibliography and cataloguing; fifth, to furnish packing and unpacking rooms with convenient approaches, bindery, and lifts communicating with all parts of the storage halls and contrived to facilitate delivery and distribution. Nothing can be more evident to the architectural mind than that these points of accommodation are exceptional in their nature, and require exceptional and in some respects unprecedented architectural dispositions both internally and externally of both plan and elevation; they cannot be housed behind any such architectural screen as is made by the external orders of the Capitol. They imply a structure as distinct in its characteristics of outline and detail as an isolated theatre, a railway terminus, a grain elevator, or a cathedral, — a mass which, if in respect to the general reading-room it could be accommodated in one of the legislative chambers, and in respect to the offices of administration it could find a degree of convenience in the surrounding committee-rooms, would find in the far larger portion devoted to the storage of books not only no adaptable or adequate space, but none could be built which would not necessarily conflict with the strict classical requirements of the rest of the building. It would seem to be impracticable to furnish accommodation for this difficult service either in the old building or in any new wing or wings which might be added thereto, without the sacrifice of some convenience essential to the library. Moreover, Mr. Walter, the architect of the Capitol, estimates the cost of a single projection of 275 feet from the present building, executed in a style in conformity with it, at not less than $4,000,000, a sum much more than sufficient for the erection of a separate building infinitely better adapted to the uses of such a library.

The present national Capitol certainly has the advantage of unity of style, and it occupies its magnificent site with the greatest dignity and grace. We do not say that it would be absolutely impossible to make an addition to this structure adequate for the purpose which we are now considering without injury to its effect of unity and noble simplicity, for it is possible to conceive that the superb western slopes in front of the Capitol towards the avenues might be occupied with a mass of buildings terraced up to the present main building which should overtop and crown the whole, like the structures upon the Capitoline Hill in ancient Rome; but all the dignity which is dependent upon the present conditions of isolation, and all the sense of repose and wholeness which is obtained from the perfect simplicity and comprehensibleness of the present architectural scheme, would thereby be exchanged at enormous cost for effects of an entirely different character, in the production of which the chances of fundamental and ruinous error would be far too great. The idea of reproducing anything in the re-

motest degree resembling the colonnade of Bernini at Rome upon these rapid slopes is absolutely unintelligible to the architect. It is the dream of a half-instructed enthusiast, — an unsubstantial pageant utterly incapable of realization. We sincerely trust that the experiment of any such wing or wings as now threaten to destroy the orderly simplicity of the Capitol may not be attempted. The necessity for immediate action, however, in respect to the national library becomes more and more apparent. Its annual increase is fully equal to that of the British Museum, which is conducted on a scale far more costly, and covers eight acres of ground, and the successive reports of the librarian indicate how dangerously overcrowded are the present halls, and with what excessive inconvenience the administration of it is attended by reason of want of space.

The advertisement of the Commissioners of the District of Columbia for school-house plans is one of the curiosities of competitions. It is a general call to architects to offer complete sets of drawings, with specifications and detailed estimates, for a school-house which is to cost thirty thousand dollars, the drawings being to full quarter-inch scale. The established charge for one set of such plans, with specifications and without the estimates, is seven hundred and fifty dollars. The Commissioners offer a prize of five hundred dollars for the best. It is nothing new to see a building committee tempt competitors by offering for the plans it accepts less than they are worth, but the Commissioners outdo their fellows by declaring their intention to keep all the plans, for two thirds of the price of a single set. Several of the leading architects of Washington have sent a protest to the Commissioners, in which, without insisting upon full compensation for the successful plans, or objecting to furnishing competition drawings to full scale, they content themselves with the modest request that plans which are not accepted should be returned to their authors. To this the Commissioners have answered succinctly that their conditions were adopted "solely in the interest of the public schools; and while the Commissioners regret that these conditions should be unsatisfactory to any, they see no good reason for changing or modifying them." If the Commissioners were to advertise in the interest of the schools for an important piece of iron construction, and were to insist on such terms as should repel the bids of the best manufacturers, we should think them very foolish commissioners. It is probable that designs will be forthcoming in answer to their advertisement, just as iron, such as it is, may always be had for much less than the price of good material. When the plans have come in answer to the Commissioners' invitation, it may appear that, as far as plans go, the interests of the public schools in the District of Columbia are not in the best of hands.

It is not too late for those who have charge of the Washington Monument to profit by the example of the several European nations which are just at this time preparing to erect national monuments. We have already spoken of the figure of Germania, which is to be placed near Bingen on the Rhine, and of the competition for an equestrian statue of Victor Emmanuel at Rome; and now we hear that the Russians are to commemorate their triumph over the Turks by a monument whose description sounds not a little grandiose and somewhat barbaric. The most noticeable of these undertakings, however, in that the details have not yet been fully decided upon, is the competition which is shortly to be opened in France for a statue of the Republic, at Paris. The site which is most spoken of, the one which is favored by the Prefect of the Seine, who is taking the initiative in the matter, is the Place du Château d'Eau, — a site which a writer in *La Semaine des Constructeurs* shows to be wholly unsuitable; for of the seven grand boulevards and avenues which radiate from it, the axes of no more than three, the least important three, intersect at the same point. Moreover, the only buildings of importance abutting on the place are barracks of questionable architectural interest. He proposes, rather, to remove the obelisk from the Place de la Concorde, a step which, he says, "will not particularly chagrin the Pharaohs," and place the statue on its site. Here, he says, "it will have before it the temple of the Law, the Corps Legislatif; it will turn its back on the past, the Madeleine; it will have the ruins of the monarchy on its left, the Tuileries; while it will have at its right the military triumphs which it disdains." It might perhaps be possible to convey into the statue some expression of regret, as it gazes at the seated statue of Strasbourg, which in order to bring it within its ken might be interchanged with one of the other seated figures which, typifying the great cities of France, encircle the place. It would be difficult to find in all Paris a more suitable site, and we think the writer has good reason for exclaiming, "What elements of inspiration, what suggestions for an attitude, are here!" Unfortunately the decision has been made in favor of the Place du Château d'Eau. In all these different cases we hear of no hint that the people would accept a lofty obelisk as the highest and most suitable expression that art could devise for a national monument.

Besides this, it seems very likely that sculptors will have as much to do during the next few years as they can do with credit. M. Viollet-le-Duc has just brought forward again a scheme which was first proposed in 1848, by David d'Angers, but which had no result. M. Viollet-le-Duc now proposes that the avenue of the Champs Elysées, between the Place de la Concorde and the Place de l'Étoile, should be lined, like the court-yard at Versailles, on either side by groups and single statues in bronze or marble of those men who have reflected credit on the city by their virtue, their courage, their learning, or their humanity. Each statue would be made the subject of a separate competition, so that it is fair to presume that the collection would contain the *chef-d'œuvres* of modern sculptors, foreign as well as French. At present, the annual appropriation for the ministry of fine arts is only $60,000, which has to be expended in a multitude of ways; so that, unless special provision is made, very few statues could be ordered each year, even at the very modest rate of $700 for each statue; for this is about what it is proposed to pay for each of the two hundred and fifty-four statues which are to occupy the niches and pedestals of the façades of the new Hôtel de Ville, while the one hundred and forty-one bas-reliefs for the same building are to cost $400 each. Notwithstanding these small prices there is more likelihood of a dearth of suitable subjects than of able sculptors, for these two schemes, which, it is said, are almost certainly to be carried out, are nearly identical, and are sure to conflict with and hamper one another. It will be more difficult to secure satisfactory statues for the Hôtel de Ville than for the Champs Elysées, for the choice is restricted to those celebrated men who were born in Paris.

The following letter has been addressed to the Secretary of the Boston Chapter A. I. A.: —

To Henry Van Brunt, Esq., Secretary Boston Chapter A. I. A.:

Dear Sir, — In reply to your communication of the 7th inst., just received, will say, in sending our circulars "to architects," we did not for a moment suppose it was contrary to any established rule for them to consider such, and we trust the mistake will be overlooked.

We hope that when our goods become known among your members, their merits alone will entitle them to due consideration.

We are yours very respectfully,

Chas. W. Trainer & Co.

The straightforwardness of this letter does not make us repent of what we said last week in the matter of illicit commissions, wherein we used Mr. Trainer's name, not to work him injury, but to point the moral more effectually than could be done by a blank. It does make us wonder whether the dealers who send such circulars think that architects have nothing but rules to guide them in their practice. It is not the ignorance of rules, but the ignoring of professional honor and fidelity, that is the offensive thing.

TWELFTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS. (*Continued.*)

THURSDAY, NOVEMBER 14, 1878. — MORNING SESSION.

The Convention reassembled at 10 A. M., and unfinished business was called up, the first being the report of the Philadelphia Chapter, which was read by the Secretary.

A letter on the metric system was then read.

The President said that one of the members of the Institute, Mr. E. T. Mix, of Milwaukee, had written a letter to the Institute about a certain competition in which he was interested, and had not been, in his opinion, fairly treated. It was for the Convention to declare its pleasure as to what should be done with the letter.

Mr. Loring knew Mr. Mix to be one of the most upright and reliable men belonging to the Institute, and hoped the Convention would hear his letter and do what it could to assist him.

The letter was read, and the time for business being short it was voted to refer it to the Board of Trustees.

Mr. Post then offered the following resolution: —

Resolved, That any member of this body who, in case of competition, should propose or agree to undertake the work for which he is competing for a less commission or compensation than his fellows in the competition violates the sole condition of membership in this society, viz., "the honorable practice of his profession;" and that upon proof of the fact to an investigating committee, which shall consist of three Fellows, who shall be appointed by the Board of Trustees upon the demand of two Fellows of the Institute, he shall be declared to be expelled by the Board of Trustees, without further action of the Institute as a body, and that such expulsion shall expel him also from the chapter.

In support of his resolution, MR. POST said that while all competitions were bad enough, there had been many cases of late where the contests had degenerated from trials of skill in design into struggles between architects as to which would take the work at the lowest charge. It was to prevent this that his resolution was intended. In it he made no reference to the ordinary charges of the profession, for the reason that there might be exceptional cases, as charitable institutions, for instance, where the terms of the competition might vary from the established rule, a commission of three or three and a half per cent being offered, instead of the usual one of five per cent. If all the architects saw fit to accept these terms, although he thought they acted unwisely, he did not wish, or think it practicable, to control their action; but where one of the competing architects sought to obtain the work, not by excellence of design, but by an offer to do it at a less price than his fellow competitors, he thought it not only competent for, but incumbent upon, this body, charged with upholding the character and good name of the profession, to expel summarily such an offender, if one should be found within its ranks.

MR. PFEIFFER asked leave to present an amendment to Mr. Post's resolution, to the effect that where several architects had been invited to take part in a limited competition, with an agreement that they should be repaid the cost of preparing their drawings, it should be deemed unprofessional conduct for any other architect to offer to submit plans free of cost, and any member of the Institute who should be proved guilty of such practices should be expelled. He had heard of an instance in New York, lately, where three gentlemen had been invited to submit plans, and were to be paid for them. Soon afterwards a member of the Institute presented himself to the committee having the matter in charge, with twenty-two letters of recommendation, begging the privilege of submitting plans free of cost.

MR. POST thought that Mr. Pfeiffer's resolution should form a separate subject of action. He would rather not hamper his resolution by any amendments. If Mr. Pfeiffer would write his motion out for separate action, the original resolution could be voted on by itself.

THE PRESIDENT called for a vote on Mr. Post's resolution, and it was carried.

While Mr. Pfeiffer was writing out his resolution, MR. POST called up his motion of the preceding day, that the Committee on Publication should be censured for having failed to publish the report of the last year's convention.

The resolution was taken from the table for discussion.

MR. POST stated again that it had appeared from the report of the Committee on Publications that the reason the proceedings of the last convention were not published was that no editor could be found. As it was clearly the duty of the Publication Committee to edit the report of the convention, and attend to the printing of it, he moved a vote of censure, unless it could be shown that there were other and better reasons than those given for not publishing the report. If there were such better reasons he would be very glad to withdraw his motion.

MR. LONGFELLOW thought that the Convention ought to understand the difficulties in the way of the Publication Committee. Several persons had been asked to undertake the editing of the Proceedings, and all had declined. Now, no one being found who would voluntarily do the editing required, had the committee authority to compel some individual to do the desired work, and if so, how should this individual be selected? For the committee, as a committee, to do the editing, would be impossible; such a thing, he thought, had never been done, and he would be glad to know distinctly what was required of them.

MR. PFEIFFER, as a former member of the Publication Committee, knew the difficulties in regard to money matters which had to be contended with, and believed that the committee had acted according to their best judgment, and hoped the motion would not prevail.

MR. LITTELL called attention to the fact that at the last convention, on the morning of October 19, it was voted that henceforth the proceedings of the convention be published in the *American Architect*. The report of the proceedings was so published, and the resolution therefore carried out. If the Publication Committee were entrusted with any further duty in the matter, and had failed in it, he would like to understand clearly about it.

At the request of Mr. Longfellow, the proceedings of the convention on Friday, October 19, 1877, were read.

MR. LONGFELLOW said that there had been a difference of opinion among the officers of the Institute, but, for himself, he had come away from the convention with the impression that the Proceedings were to be published in pamphlet form, as usual. But however that might be, he certainly had not received any impression that the Convention required him, any more than any other member, to act as editor. He had done so the year before, and when requested to do so again he had declined to undertake it. If he had imagined that his position on the committee imposed such a duty on him he would certainly have resigned at once.

THE SECRETARY hoped that the resolution might be amended or withdrawn, in consideration of the difficulties and misunderstanding under which the committee had labored, and in view both of Mr. Longfellow's explanation and of the great and continued service which he had done to the Institute and the profession.

MR. LORING said that he could testify to the amount of hard work which the committee had accomplished in getting their material ready for publication in the *American Architect*, and he thought they should receive commendation rather than censure, and hoped the resolution would be withdrawn.

MR. POST withdrew the resolution, and the regular order of business was taken up, the first subject being the Memorial Address upon the Life and Services of the late Richard Upjohn, read by the President, Mr. Walter.

MR. HATFIELD offered the following resolutions, which were carried: —

Resolved, That the Memorial Address prepared and just read by our President be adopted as an expression of the sentiments of the members of the Institute, regarding our late President, Richard Upjohn.

Resolved, That the Memorial be entered upon the minutes of the Institute, and a copy be furnished to the family of the deceased.

MR. POST asked for a suspension of business to offer a resolution that after the election of officers the present Library Committee be desired to report to the Convention a scheme for securing the publication of the Proceedings within thirty days after the adjournment. The resolution was carried.

MR. LITTELL remarked that the report would simply be that it was impossible to do it within sixty days.

MR. POST then proposed that a sub committee be appointed.

MR. LITTELL proposed something better than that: that Mr. Post should be appointed editor; then he would find out for himself what the difficulties were.

MR. POST could not understand why, if a great newspaper could be edited and published in one day, the Proceedings of this Convention could not be published in two months. He moved that the present Committee on Publications report, after the election, a plan to secure the publication of the Proceedings of this Convention within a reasonable time after the adjournment of the Convention.

MR. HAIGHT moved to amend by substituting the words "sixty days" for "a reasonable time."

MR. LONGFELLOW moved to amend by adding "and the committee be authorized to procure an editor for the Proceedings at an expense of not more than seventy-five dollars."

MR. POST said that the object of the resolution was to obtain suggestions such as this, as to the best way of getting the work done.

The resolution, with Mr. Haight's amendment, was then adopted.

MR. STONE then reported that the Auditing Committee had examined the Treasurer's report, and found it correct.

The report of the Nominating Committee was then called for, and presented by Mr. Stone.

Mr. McKim, to the regret of the committee, had been obliged to decline serving a second term as Secretary. Mr. Littell also declined a renomination on the Committee of Publication.

By consent of the Convention, all the names were voted for on a single ballot, and the ticket as presented by the committee was elected.

MR. WALTER expressed his thanks for reëlection. It had always seemed to him that the President of the Institute ought to be a resident of New York, but since the Convention had seen fit to express its confidence in him by continuing him in office, although he lived a hundred miles away, he should show his appreciation of the compliment by renewed exertions to promote the interests of the Institute.

Miscellaneous business was then called up.

MR. STONE said that it seemed to him that the future of the Institute depended, to some extent, upon the publication of its Proceedings in permanent form, in addition to the publication in the columns of the *American Architect*. He thought that for the Institute to say that it had no money to publish its Proceedings was like a business man saying that he could not afford to buy goods. He thought also that when a member at a distance applied to the Institute for advice or support, the Convention ought to consider and act upon the application. This was the chief use of membership in the Institute to persons in distant parts of the country, and it should try to make itself a tangible existence to such persons by responding to their wishes. What was the use of paying fifteen or twenty-five dollars a year to the Institute, when the members got no good from it? At present there was no account of its proceedings officially published, — not even a list of the members. It was very important that attention should be paid to these points.

MR. LONGFELLOW reported for the committee that the best plan they had been able to devise in the short time allowed them was to suggest that the present committee, which remained in office till January, 1879, should be instructed to publish the Proceedings of the Eleventh Convention, leaving the Proceedings of the present or Twelfth Convention to their successors' care; that the committee should be authorized to employ an editor, at an expense of not over seventy-five dollars.

MR. POST thought that if it was so laborious a task to print the Proceedings, it would be better to print those of the present Convention at once, as it was important to have them issued without delay. The report of the Eleventh Convention might be left to a future time. One thing was certain; that the Institute had not funds to do the publishing in either case, and money must be raised. It

appeared that from three hundred to four hundred dollars had been the cost in years past, but Mr. Longfellow could estimate about that better than he could.

Mr. Longfellow thought the expense of printing would be about three hundred dollars.

Mr. Hatfield. "And whatever is paid for editing must be added to the three hundred dollars."

Mr. Post. "Then the assessment on Fellows will be four dollars, and on Associate Members two dollars, to provide sufficient funds for publishing the Proceedings of this Convention. If both Proceedings are to be published the proportionate assessment will be eight dollars for Fellows and four dollars for Associates."

Mr. Longfellow thought this seemed like throwing upon the present committee the burden of publishing both reports before the first of January.

Mr. Post said that some committee must take charge of both reports. If the present committee threw it over on the next, that one might shift it to the following one.

Mr. Pfeiffer reminded the Convention that, with the best will in the world, the Publication Committee could not make sure of a prompt issuing of the Proceedings. All the different committees expected that their chairmen should have time to revise their reports, and months often expired before these were returned for publication. He thought no resolutions would help the committee to hasten their work, unless every committee would submit its report to the Convention in such form that it could be taken and published without modification. Undoubtedly it was important to have the publication as soon after the convention as possible, while the interest of the members of the Institute was fresh. After three or four months their interest almost ceased. On one occasion the Publication Committee had taken advantage of a very full report of the proceedings published in a daily paper of the town where the convention was held, and had it immediately reprinted in slips and sent to every member of the Institute.

Mr. Longfellow thought it unusual, even if possible, to require the committee to publish the report of the convention before their successors, who were appointed at the convention, came into office. If the Proceedings of the Eleventh Convention were published before the 1st of January, the committee appointed by the Twelfth Convention might have the report of their convention all ready to publish the next day, and so each convention could be reported by its own committee, as had always been the case. He could see no reason for changing this rule, to double the labor of the present committee.

Mr. Post moved that an assessment of eight dollars on Fellows and four dollars on Associates be made for defraying the expense of publication of the Proceedings of the Eleventh and Twelfth Conventions.

Mr. Stone offered an amendment, that the Treasurer be directed to collect from Fellows and Associates the regular fees. The fees had been reduced two years ago, in the hope of increasing the membership. This result had not followed, and the additional assessment now laid was simply a return to the old scale.

Mr. Hatfield said that the bills were already out, according to the last scale of dues, and many of them were paid.

Mr. Post remarked that the method proposed by Mr. Stone would furnish only five eighths of the money required. Mr. Stone's amendment was lost, and Mr. Post's original resolution was adopted.

After a moment's interruption, to request those members who proposed to accept Mr. Beckwith's invitation to visit his works in New Jersey to signify their intention, Mr. Pfeiffer called up his resolution relating to limited competitions.

Mr. Post objected to the form of the resolution, not to the substance. He was in favor of something of the kind, but thought it difficult to frame a resolution to cover all cases. For instance, he was once invited, with several other gentlemen, to compete for a certain building, each competitor to be paid a certain sum. To secure that a full commission should be paid to the successful competitor, and to obtain certain other guaranties, he had agreed for his part to waive the payment appointed for each person competing, and had proposed that all should do the same. Under the letter of the pending resolution, he would have been liable to censure in this case, whereas he actually tried for, and obtained, better terms of competition for all those who entered than the ones first offered. He did not wish to take the time of the Convention to go into particulars, but they could see that a little care was necessary to avoid attaching censure to parties hastily, without knowing all the circumstances. He would like to have the resolution altered slightly.

Mr. Robertson thought that the feeling of the better part of the profession was unquestionably opposed to competitions without remuneration to all the competitors. For an architect to offer his services free when competing architects were compensated for their trouble was universally regarded as unprofessional, and he thought that the general feeling went further than that, and was disposed to regard as unprofessional all offers to prepare drawings without compensation. He would be glad to draw forth an expression of opinion from the Convention on this point. It was certain that competitions would never be satisfactory until that point was fixed, and an understanding was entered into among the better part of the profession that they would not furnish drawings in competition without being paid for them. This question was becoming daily more important, and paid competitions were becoming rarer every year.

Mr. Pfeiffer thought Mr. Post's amendment was not sufficiently emphatic in regard to the most important point in his resolution, that which referred to the architect's offering his services free of charge. This habit, he was convinced, degraded the profession in the eyes of the community. Not long ago a bank president asked him to call at his bank. They wanted to make alterations, and requested him to offer suggestions and submit sketches. He replied that he would do so if he were paid. The bank president was surprised that he should ask that. He supposed that an opportunity of submitting sketches would be esteemed a great privilege. "I asked him," said Mr. Pfeiffer, "if he ever employed counsel for the bank. He said he did. Then I asked him if his practice was to go around among counsel and invite them to prepare briefs, and expect them to make them free of charge, and submit them, so that he might select that which suited him best, and pay only for that. He said no; the lawyers did not do that, but the architects almost ran him down in their eagerness to get such an opportunity as he offered to me. I think that such incidents occur too often, and that they are a disgrace to the profession."

Mr. Post. "Every question has two sides. If every gentleman here present will agree not to make any drawings unless he gets paid what they cost him, I will subscribe gladly, and adhere strictly to the agreement; but I have no sympathy with men who do a thousand dollars' worth of work, and accept a hundred and fifty dollars for it. If any ten or fifteen respectable architects in New York will agree never to do any work unless twenty-five per cent profit is paid them, I will join, and keep the agreement: but I do not propose to bind myself by a resolution which would allow a man to offer to make a set of plans for five dollars, and spend a thousand dollars on the drawings, and say he is doing right because it is a paid competition. To show what I mean, I will explain more fully the matter I mentioned before. A gentleman wished me to submit plans for a certain building, and offered two hundred and fifty dollars for the plans, two and a half per cent commission for carrying out the work, and the drawings were to be the property of the party paying the two hundred and fifty dollars. Statements were made to me that other architects had agreed to these terms. I said I could not. I ask you if I was not more professional than those who accepted such terms. I said, 'If you will agree that if my plans are adopted you will pay me five per cent on the cost of the building, and my travelling expenses, and farther agree that no idea of the plan which you gained from me shall be in any respect used, unless I shall be appointed architect, I will make sketches for you for nothing.' And I did it, and would do it again, under similar circumstances, and consider that I acted more for the interest of the profession than I should have done by accepting one half or one quarter of what it cost me to make the plans, under the terms first offered. I am as much opposed as anybody to the practice of offering, in the case of a paid competition, to submit plans for nothing, but there is not much difference between that and accepting a mere pittance, and if any resolution is to be passed it should cover this point, and not leave it open for any member of the profession to receive for his plans a few dollars and then claim that he has been engaged in a paid competition."

Mr. Longfellow asked Mr. Pfeiffer if the substitute resolution did not cover the ground he wished.

Mr. Pfeiffer thought that Mr. Post put it too mildly. Instead of "may be," he would substitute "shall be." He thought that the first resolution of Mr. Post could be avoided by a device similar to one from which he had suffered. He was once engaged in a limited competition. He went to his antagonist and said to him that they were both members of this Institute, and that he had himself sometimes been told that he charged more for his services than other architects, and wished to know how much commission his competitor proposed to charge, — whether he intended to keep to the Institute schedule. He found that his competitor had already notified the parties that he should charge five per cent, so they parted with the understanding that the Institute schedule should govern both parties. After the plans were submitted, he learned from some of the principal parties interested that his plan had been recommended for adoption, but the building committee had felt obliged to consider the question of expense of the architect's services, and his competitor had offered to receive his five per cent commission, but to make a donation to the institution at the end of the work, amounting to two per cent, so that his actual charge would be reduced to three per cent. Now, under Mr. Post's first resolution, a person could not be expelled in such a case, as every man had a right to make donations to institutions.

The change from "may be" to "shall be" having been accepted by Mr. Post, Mr. Pfeiffer withdrew his resolution, and the substitute offered by Mr. Post was carried as follows: —

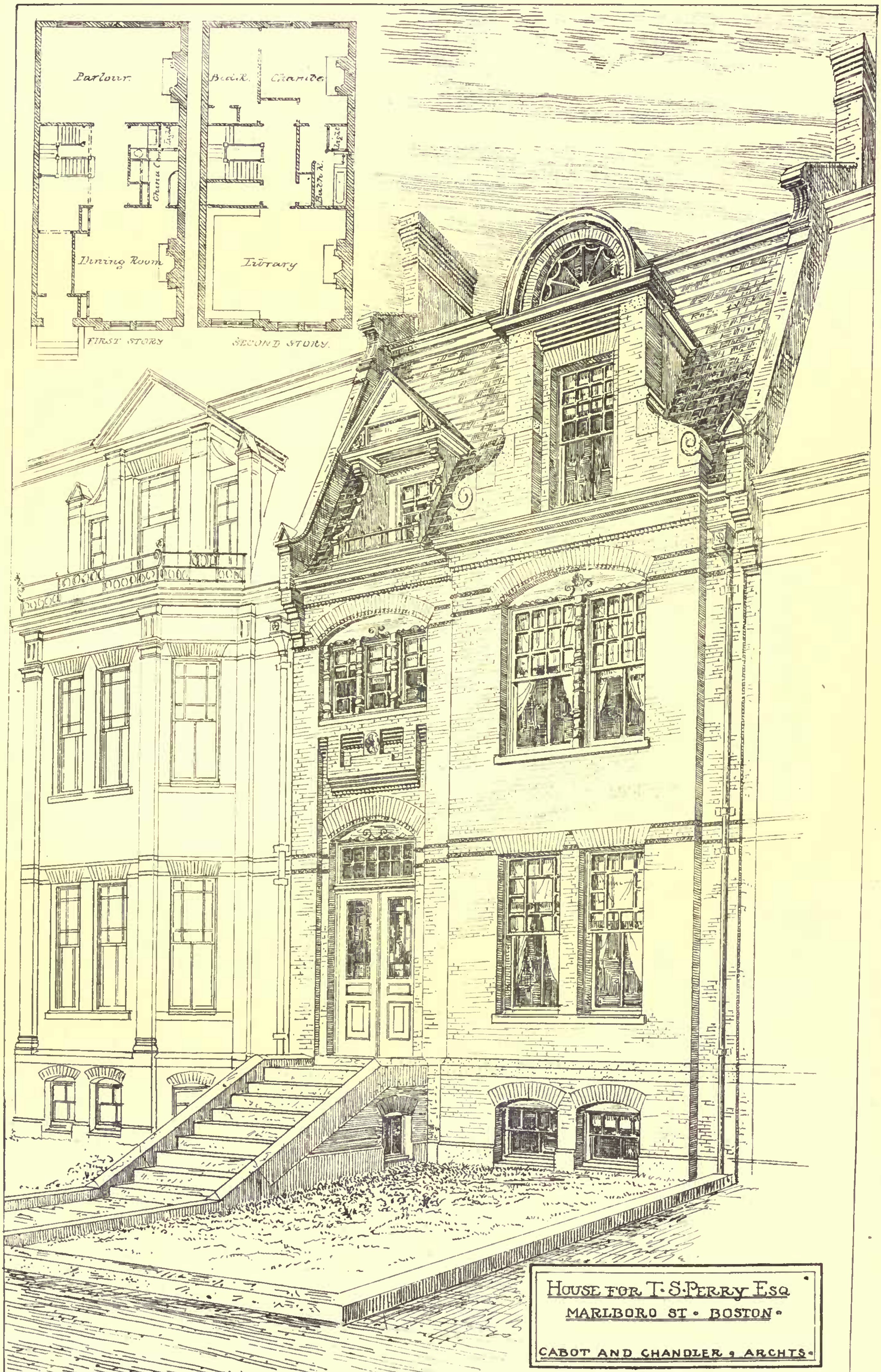
Resolved, That if in case of paid competition any member of this Institute shall offer his services free of charge, he shall be liable to censure, if charges are made by two Fellows and a committee appointed as provided in a former resolution, for censure for violation of the conditions of membership in the Institute.

Mr. Longfellow then read the report of the Committee on Ways and Means. (See *American Architect* for February 15, 1879.)

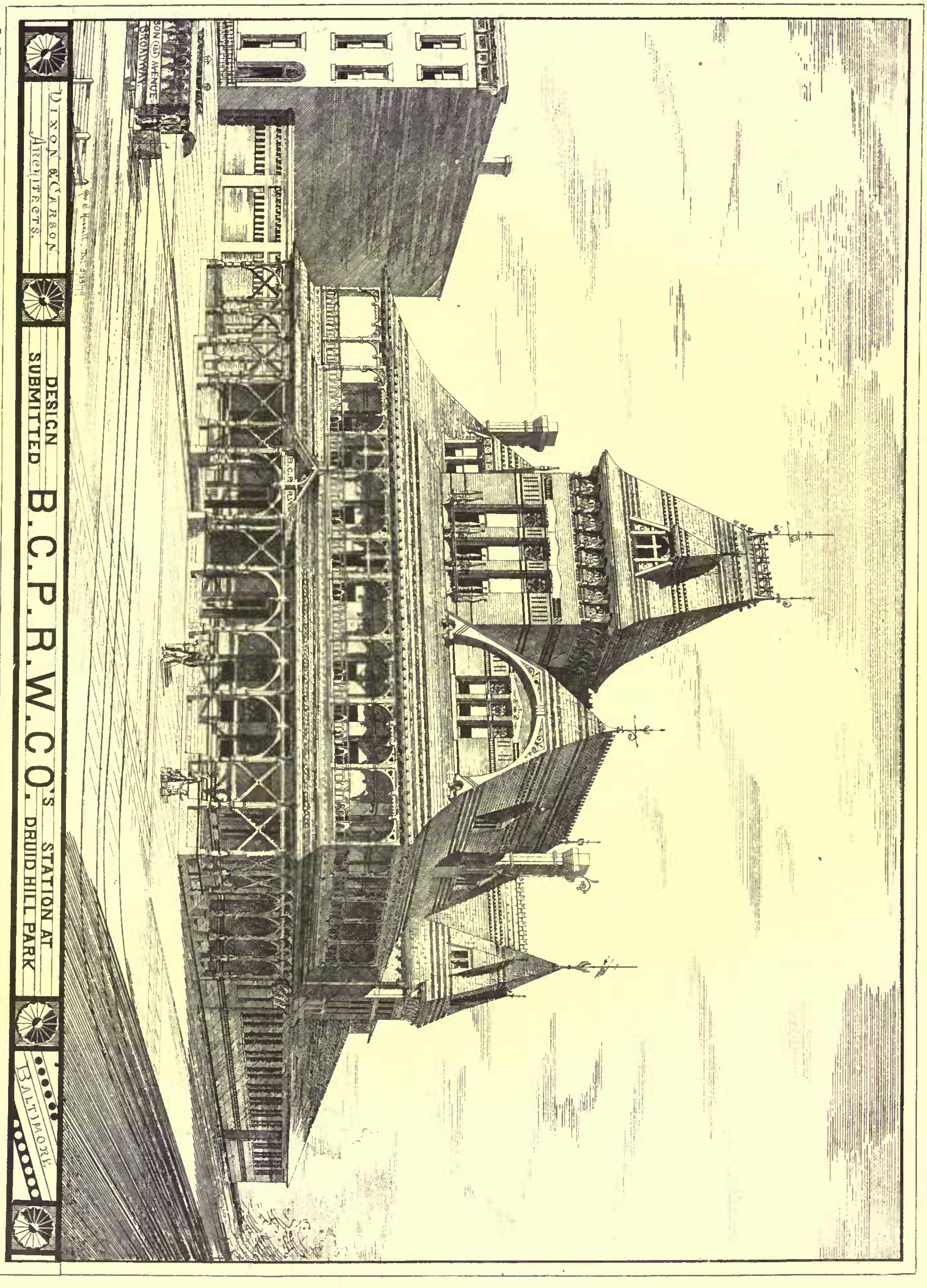
A paper offered by Mr. Bloor, to be read in case there should be no other business, was accepted without reading, and referred to the Committee on Publication.

A letter from Mr. Cummings was read.

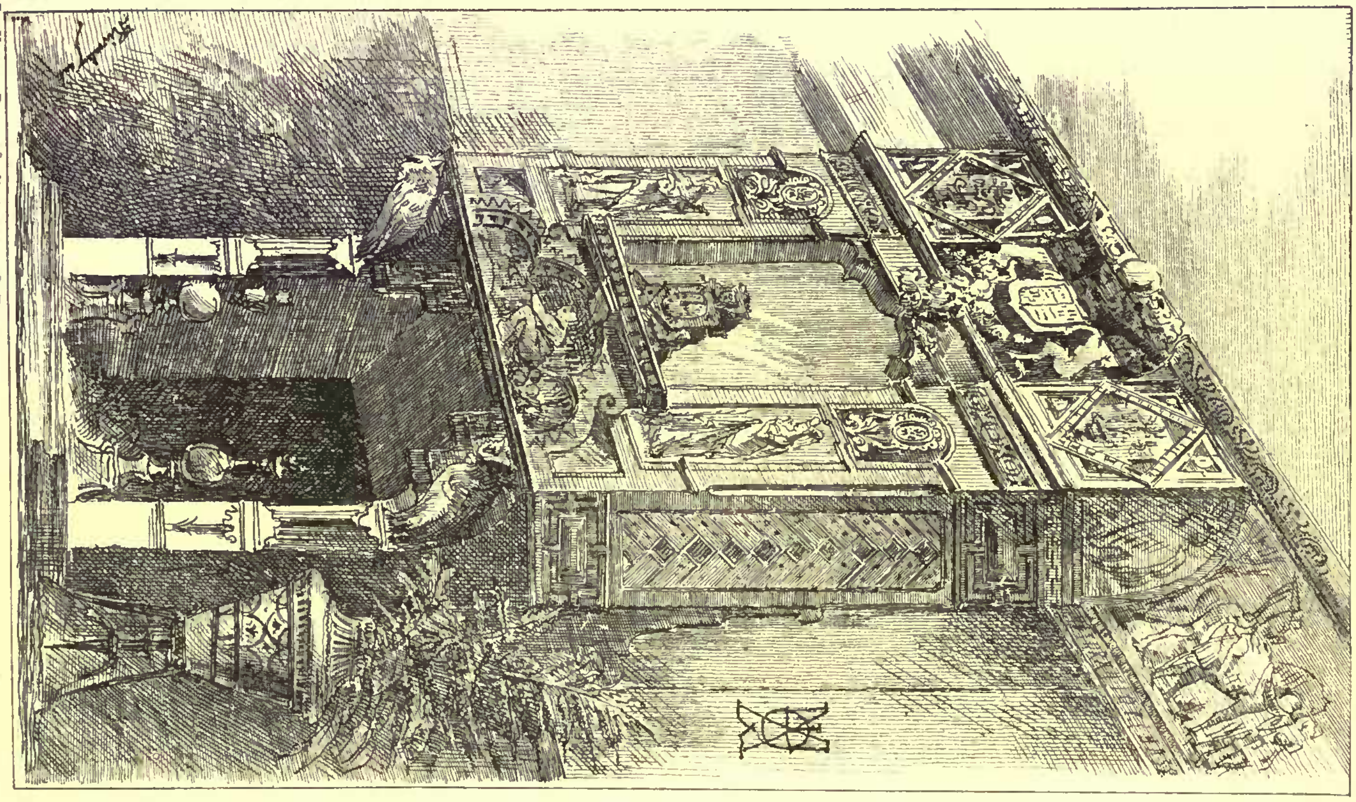
The letter was, on motion of Mr. Longfellow, referred to the



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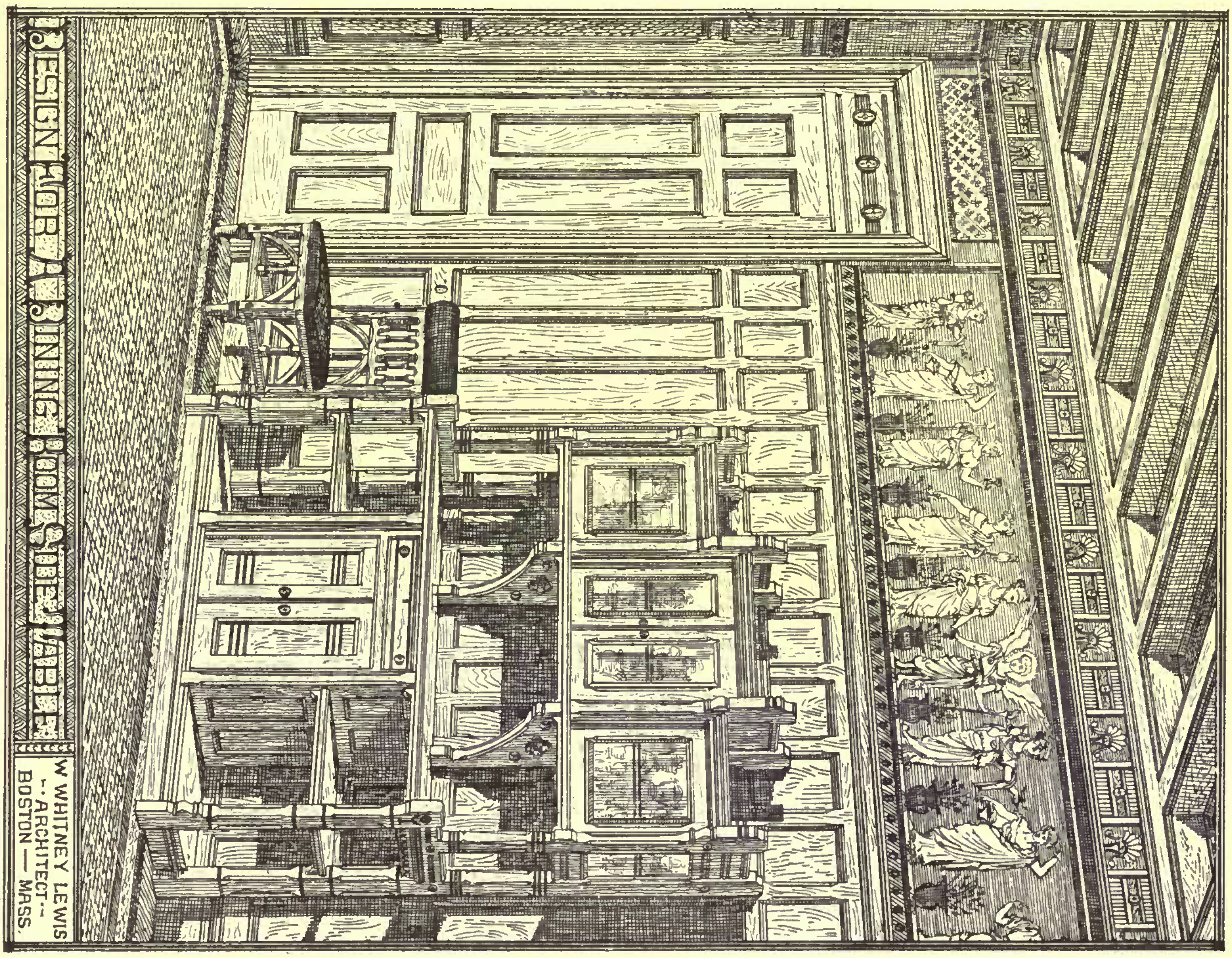


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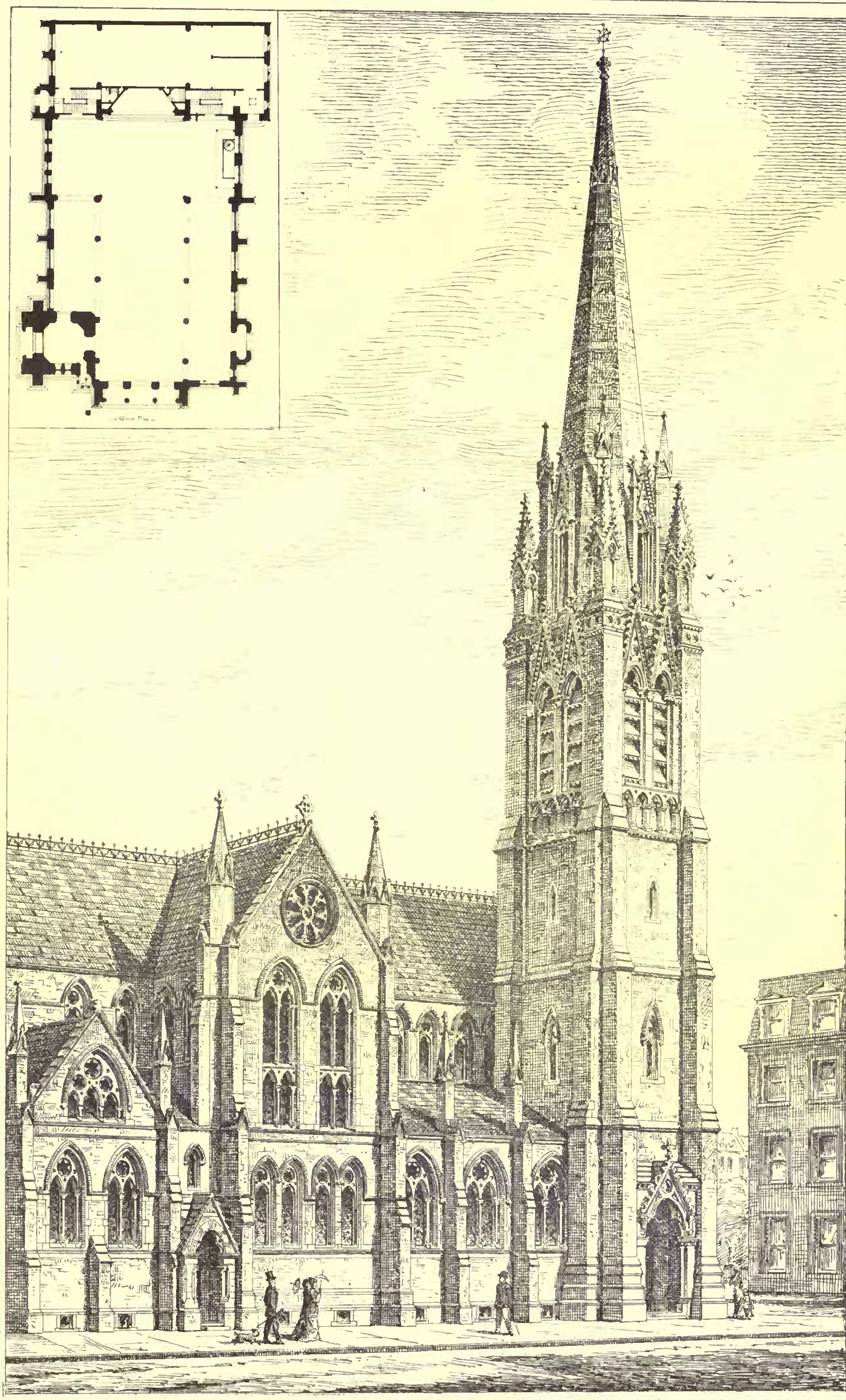


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Board of Trustees, with a recommendation to take counsel on the subject, with power to act.

The Committee on Publication was, by vote, authorized to employ such assistance as they might need in the discharge of their duties.

The thanks of the Convention were voted to the President and to the Committee of Arrangements for their services.

Before putting the motion of adjournment, the President requested the members to send him corrections of any errors which they might have observed in his paper on the late Mr. Upjohn. He had had to depend on all kinds of information, and would be glad to be corrected.

The Convention then adjourned.

THE ILLUSTRATIONS.

THE CENTRAL CHURCH, BOSTON, MASS. MR. R. M. UPJOHN, ARCHITECT, NEW YORK.

THIS church was built at the corner of Berkeley and Newbury Streets ten or fifteen years ago. The materials of which it is built are Roxbury pudding-stone relieved by freestone finish. This view is taken from the southwest.

HORSE RAILWAY STATION AT DRUID-HILL PARK, BALTIMORE, MD. MESSRS. DIXON & CARSON, ARCHITECTS, BALTIMORE, MD.

This building was designed for a terminal station in the Druid-Hill Park, which is just beyond the northern confine of the city and is a natural park of beauty unrivalled in the eastern part of this country.

HOUSE FOR T. S. PERRY, ESQ., MARLBOROUGH STREET, BOSTON. MESSRS. CABOT & CHANDLER, ARCHITECTS, BOSTON.

This house is now building on Marlborough Street, between Fairfield and Gloucester Streets. It is twenty-four feet wide and fifty feet deep. The front is of face-bricks with a few decorative bands of Philadelphia moulded bricks. It is on the south side of the street, and the parlor is at the rear, to have the benefit of the sun. In the second story the library occupies the whole front of the house, the bookcases running under the high windows over the front door. In the third story are four chambers and bath-room, and a fourth story is carried up in the rear, giving two chambers for servants, with trunk-room and closets. All the small glass in the front windows is to be amber-colored cathedral glass. The plans are peculiar in having only one staircase, it being a necessity to unite with economy of construction an economy of service, and also that the parlor should occupy the whole width of the rear. The masons are Woodbury & Leighton, and the builder is S. H. W. Pierce.

DESIGN FOR A DINING-ROOM SIDE-BOARD. MR. W. W. LEWIS, ARCHITECT, BOSTON.

CHIMNEY-PIECE, DESIGNED BY M. EUGENE LEDOUX, DECORATIVE PAINTER.

This chimney-piece, which we copy from *Le Moniteur des Architectes*, was designed for and erected in an English house. The lower portions are of stone, while in the decoration of the fire-place itself faïence plaques are used. The hangings are embroidered by hand; the upper portion is of wood, with panels painted in enamel, upon the execution of which the effect of the chimney-piece largely depends. The cost was about three hundred dollars.

CORRESPONDENCE.

FIRST VIEW OF THE CITY. — MODERN BUILDINGS. — BYZANTINE REMAINS.

ATHENS, March 15, 1879.

PREPARED for deep blue skies I could more easily recognize the Isle of Mull and the port of Oban, than the Isles of Greece, as we passed by rocky shores, swept with rain from the dark hills behind, and dropped anchor in the land-locked harbor of the Piræus. This aspect was certainly not the poetic or conventional one, but recalls the fact that though the purest of blue skies might have refined the Greeks' æsthetic sense, they were no dreaming Orientals, but a hardy mountain race, whose exposure to keen northern winds gave a firmer beauty to their limbs, and stimulated them to that restless activity of mind and body which explains their incomparably rapid and brilliant civilization. This first view, however, was undeniably disappointing, till suddenly the storm-clouds lifted and revealed, rising from the plains, a square-backed height crowned by a smaller rectangular mass — the Acropolis and the Parthenon. By a happy chance the Acropolis, as seen from the entrance of the Piræus, just rises to the level of a dip in the mountain outline behind, and must have looked of old to the incoming travellers like a vast altar built to raise against the sky the great Athenian offering to Minerva. And this effect is much the same now as when Pericles from his galley first saw it. But everything else is changed. The barren conical peak, rising just beyond the Acropolis, gives to the scene a key-note of desolation which is echoed back by the barren sides of the more distant heights of Parnes, Pentelicus, and Hymettus, which bound the plain and its gray olive groves.

Passing through the Piræus, where as yet nothing has been discovered to distinguish it from any small port, the railway leads in about twenty minutes to Athens. The road curves by the pretty bay of Falerum, now a modern bathing-beach, where I remarked the wooden proscenium of an open-air theatre; the stage, being recessed deeply, is so curved as evidently to act as a powerful sounding-board. All along the line may be seen remains of the ancient Long Walls which joined the Piræus to the city. Soon the front of the Acropolis appears for a moment, finely framed between two ridges; but this nearer view reveals its sad dilapidation. Another curve in the line and there comes in view the whole side of the grand pedestal of Grecian art, with all the ruins of its former glory.

From a neat little railway station a broad, straight street slopes up through the city to a large palace, whose bare, square walls derive little beauty from the purity of Pentelic marble finish. It was begun in 1836, and its size and interior decoration are too pretentious to excuse its ugliness, which remains an unfortunate souvenir of King Otho. His Queen, Amalie, however, was not wanting in taste, for she is said herself to have laid out the pretty garden attached to the palace. It was after the removal of the capital of Greece from Nauplia to Athens, in 1834, that the present city was built upon the débris left from its destruction during the War of Independence. This accounts for the absence of all mediæval streets and buildings, except four small Byzantine churches, and also for its resemblance to a modern German town; for the nomination of a Bavarian prince to the throne of Greece naturally brought in a strong Teutonic element. This German element is still more apparent in the new part of the town — curiously the west end — where there are many fine houses just built and building by wealthy Greeks. There is a movement among the latter — who are prominent bankers in all Levantine cities and in Russia — to return and live in their rising capital. Few nations have been as patriotic as the Greeks, and this may be traced in the public buildings, all of which, except the Palace and Assembly Hall, are the gift of individuals. Naturally, the style of architecture is Grecian in detail, but, as is the case in Germany, its dry coldness at once suggests that country rather than the spontaneous grace inherent in the old Greek buildings around them; and this fact is a striking commentary on the dead classic style for which the truly learned archæology of Germany is responsible. The University, begun in 1837 by Hansen, a Danish architect, is a simple academic design, with suggestions of polychromy, which were at that time probably more daring and successful than they seem now. In general the houses, which are built of stone faced with stucco and the roofs with acroteria, are tinted with pale colors, and in good taste. The last and most ambitious design is that of a new National Academy, of white marble, with the mouldings picked out in red, and crude in effect; but as the building, though costing over five millions of francs, is not yet finished, this may be modified. Unfortunately the perfectly academic design of a central peristyle with wings is far too important for the size of the building, and it looks curiously like a pretty model. The defect in scale is heightened by two great Ionic columns standing in front of the building to support statues of Minerva and Apollo. This is the gift of the present Baron Sina, a well-known banker at Vienna. An observatory located near the Areopagus was built and endowed by the late baron. A large building for the sittings of the Chamber of Deputies has been finished lately, while a Museum and Polytechnic School are also built and awaiting an outer coating of Pentelic marble, so that at this rate Athens is rising from her ashes with real American rapidity. Though the larger part of the city still consists of narrow lanes with small one or two story houses, with the rapid increase of population this village character will give place to one more worthy of a national capital. The population before the revolution amounted only to from twelve thousand to fifteen thousand, against forty-five thousand in 1871, not including the Piræus, with its eleven thousand inhabitants; and as the Greeks, although for so many centuries kept in the most degrading servitude, have not only given proof of the noblest patriotism, but are undoubtedly, with the Armenians, the cleverest people in the Levant, Athens will probably again become an influential city. In this aspect nothing is so hopeful as the genuine desire for education. The university has more than twelve hundred students, who come from various parts of Greece and Turkey. We may be proud that all the female schools have been developed by the efforts of a Protestant Episcopal clergyman from America. The Rev. J. H. Hill and his wife obtained leave in 1831 to educate a certain number of girls as school-teachers, and in the hands of the latter is now the education of women in Greece.

Of the four Byzantine churches, out of three hundred in Justinian's time, which have escaped destruction, the largest, St. Nicodemus, has lately been given to Russia and handsomely restored. It is a dignified little building, being only 62 by 45 feet large, the dome measuring but 21 feet in diameter. The proportion of piers and vaults is so good as to increase effectively the apparent size. The side aisles as well as the double arcade in front of the dome are vaulted with flat cupolas, while the central dome is partially pierced with windows, the outside showing a low drum. This marks it as transitional between the early Byzantine churches, in which, as at St. Sophia, the domes were pierced by windows, and those of the Neo-Byzantine style, in which light is introduced through windows in a drum. The restored decorations are in the true Byzantine style, — formal figures upon the gold ground of the domes, and palm-trees and floral scroll designs appropriately introduced. Here, as in all Greek and Russian churches, the Bema or Sanctuary in the apse or apses — Greek churches are generally triapsidal — is entirely closed by a screen called the Iconostasis, from the icons or holy pictures intro-

duced in panels, a feature used as long ago as the building of Saint Sophia; this screen in wealthy churches is lavishly ornamented and the figures of saints upon a gilt ground produce a gorgeous effect. In it there are one large central door and two side ones. The former is open during the service and reveals in the dim interior a rich altar and furniture; and when the priest, in his tall black cap and black robe with gold bands, appears from time to time at the open portal to declaim something, the effect is startling. In all the paintings, ancient ecclesiastical traditions are followed, and these — like the Egyptian canons — fix the color of hair and eyes, size of features, etc., which are somewhat after Perugino's types. The shrines, before which prayers are said, have pictures covered with a *repoussé* sheathing of silver and gold, which suggests the lines of the paintings beneath, and leaves bare only the faces and sometimes the hands; this was originally ancient work, but is now freely reproduced, and Russia sent some rich examples of it to the Paris Exposition. The division of sexes is maintained and there is often a gallery for women over the Narthex or west end. The church in question is built of stone with alternate courses and finish of brick, and has a heavy campanile with bells, standing at some distance from the church.

Of the true Neo Byzantine type is the old cathedral, measuring only 40 by 20 feet. It has on each face small gables with double-light windows, and a central lantern with tall windows penetrating slightly the flat tile dome. Its chief interest lies in the numerous classic and Byzantine bas-reliefs incrusted in its outer walls. It is popularly said to be of the sixth century, but it is probably not earlier than the eighth. In the centre of the principal street stands another Byzantine church with a characteristic feature of the style: the west front preceded by three or four low gables roofing the narthex. The new cathedral has some handsome Pentelic marble columns, and is richly and not unsuccessfully decorated in the Byzantine style; but the exterior is of a poor, nondescript character.

I have purposely left myself little space to speak of the great classic remains, as they must be well known to the readers of the *American Architect*. All I shall attempt is to sketch the general position of the ruins, whose details photographs and books give with perfect decision. Winding through narrow lanes the way to the Acropolis leads up a steep slope to the base of the rocks on which are planted the yellow walls dating from many epochs. Passing around them to the front, a beautiful view opens. On the right, below, stands the temple of Theseus, — almost perfect, except for the loss of its sculpture; at one's very feet Mars' Hill and the broken cave of the Furies. To the left is the Areopagus, and the hill yonder is the Pnyx. Across the green plain lies the little bay of Falerum, and the masts and houses of the Piræus are white against the blue waters of the gulf of Salamis. For, after my gloomy arrival, the sky here fully justified its reputation and was intensely pure and blue, and the sea reflects its subtlest tints. Passing around the front and under an arch beyond, one is just above the ruins of the Odeum of Herodis. Here one enters a small court full of fragmentary sculpture and passes out upon the remains of the great steps leading up to the Propylæa. Above, on the right, is the restored small temple of Niké Apteros, whose ruins were accidentally found not many years ago, completely buried. Its neighbor, the unsightly Venetian tower, has been demolished. Passing between the wings and through the white columns of the Propylæa, — following the ancient chariot ruts, — there is a fine view on the right of the yellow columns and partially remaining pediment of the Parthenon. These columns, scarred by the bombardment of 1827, and with wide gaps in the side row, look wofully mutilated, but the dignified elegance of even these remains soon appeases all feelings of disappointment. At some distance off on the left is the Erectheum, surprisingly small, but as delicate and refined as a goldsmith's work. These are all the buildings now to be seen on the Acropolis. The celebrated Monument of Lysicrates and the Tower of the Winds are in the midst of the town. The great columns of Jupiter Olympius lift their Corinthian capitals upon a bit of table-land outside of the city.

Of the several museums now forming in Athens, that of Dr. Schliemann's collection of articles found in tombs at Mycenæ excites the most curiosity. He claims to have discovered the tomb of Agamemnon, but though the gold trinkets and vessels are rich enough to have been buried with that great prince, there seems no evidence for this hypothesis. What is singular is that neither the designs upon the articles nor the forms of the latter are the least Greek or Egyptian in character, but are as unlike any other known styles. They are certainly very ancient, as Mycenæ was destroyed in the fifth century before Christ. The French and German governments have each an archæological school here of half a dozen students. R.

AN ARCHITECT'S DEATH BY VIOLENCE. — A PLEA FOR THE UNITED STATES TESTING BOARD AND A BETTER SYSTEM OF TABULATING THE RESULTS OF TESTS.

Keokuk, Iowa.

A criminal case of a great deal of interest to superintending architects has been tried here lately. The State charged C. A. Calhoun, a building contractor, with manslaughter of an architect, A. Lourie, in causing his death by pushing him off the first story of a building, which he was superintending, into the cellar, whereby his neck was dislocated, producing incomplete paralysis, resulting in death in five months after the injury. The contractor had threatened to throw the architect off the building if he persisted in asserting that certain of the window-frames were not plumb. The main points of the defence were, that death was not intended, inasmuch as the height of the fall (sworn to as three to five feet) was insignificant, and not to be assumed sufficient to produce death; and that the victim having lived five months after receiving the injury, death was attributable to other causes, and particularly to the malpractice of the second medical attendant, called in on the twelfth day after the fall, in endeavoring to reduce the dislocation (which the prosecution contended was produced by the fall), whereby death resulted. The theory of the first medical attendant (who treated the patient for two weeks for contusion and neuralgia) was that there was no paralysis; that the patient suffered from concussion of the spinal cord; that therefore rest was the proper treatment. The theory of the second medical attendant was founded on a very critical surgical examination, by three different doctors, of the spinal column at the neck, to be sure of the fact of dislocation before attempting to reduce it. The defence having succeeded in creating a doubt in the minds of the jury that the fall was the direct cause of death, a verdict of "not guilty" was returned by it. But in a previous trial, last spring, the jury disagreed, standing six to six for conviction.

I observe that the preliminary trials of the testing machine built for the United States Testing Board have already suggested some important facts in regard to the ultimate strength of iron, sufficient to alarm the community and to forcibly renew anxiety for the absolute safety of iron bridges and other structures throughout the country, and especially such bridges as were designed with small safety margins, and proportioned with reference to large ultimate strength of iron, which is now found to be in alarming excess of the real strength. The great importance of these tests to the community generally should call forth a widespread, persistent appeal for necessary appropriations to enable the Testing Board to continue its most valuable investigations of strength of iron and steel, etc., in the various conditions of its employment, many of which are yet in uncertainty. It would be well that, instead of only the best of each kind of material being selected for experimental testing, the worst grades and qualities and the lowest samples of the grades employed in any and every part of the country were also tested, and the lowest as well as the highest results in the different grades tabulated, instead of tabulating mean or average strengths as is the pernicious habit adopted in many of the published tables. The result often is that the inexperienced incautiously adopt these average strengths for proportioning the parts of their structures, and thereby produce insecurity. As an illustration: say a certain sample of a brand or quality of iron will break with 40,000 pounds, while another sample of the same brand will break at 60,000 pounds, the average is tabulated at 50,000 pounds, being 10,000 pounds, or one fourth, in excess of the real strength of the weakest sample of the brand; now there are few who could tell the weaker from the stronger sample by inspection. Add to the above the prevailing practice of adopting small safety factors, and there is seen to be great liability to reduce the real strength of a structure to a dangerous degree. The testing machine has also made conspicuous the uncertainty in the value of the test of a hydraulic press, in that the friction is sometimes fourteen per cent of the force of the piston as indicated by the pressure guage, and that the friction varies by no fixed law with the changes in the fluid pressure in the cylinder, so that this element of the value of the hydraulic press method of testing must be allowed for. Another consideration of interest in connection with iron in large bridges is the straining effect produced by the constant variation of the temperature of the air, and of the heat of the sun's direct rays from winter to summer, and from day to night, which produce enormous internal wrenching forces in the various members of the truss of a large bridge structure, tending to distort and strain it unequally in its various parts, whereby some members are liable to excessive strain on the sides of the structure, as they are alternately exposed to the sun's rays throughout the day. For instance: a change of 90° F. will produce an elongation, and vice versa, of $\frac{1}{8}''$ in seventeen feet, and exert a force or strain of a ton per square inch of section of metal. It has been observed that the longest span (450 feet) of the Victoria Bridge over the St. Lawrence River at Montreal is not only lengthened 6″ from morning to night of a summer day, but that it springs 7″ out of alignment on the sides and top as they are alternately exposed to the sun throughout the day. Whether this constantly repeated daily expansion and contraction in the metal while under strain contributes to crystallization of the fibres is not much regarded; certain it is that the changes and excesses of strain due to this cause must be equally injurious with the strain of ordinary live loads on bridges. Alex. Black.

CHARGES AGAINST THE DEPARTMENT OF BUILDINGS.

New York.

The rumors, reports, and hints, pointing in the direction of the Department of Buildings, which for months have been floating about in building circles in this city, have at last taken shape, and on Saturday last, April 12, Geo. C. Barrett, Judge of the Supreme Court, on the application of five taxpayers, issued an order for an investigation of this department. This step is in accordance with the provisions of the new charter. The parties applying are Michael Brennan, Henry McGuckin, Peter Ward, Edward Purcell, and Rufus Darrow, all of them builders of this city whose business with the department

is extensive and intimate. These charges must now be met, and affect not only the Superintendent, Henry J. Dudley, but Robert McGinnis, the chief of the Bureau of Inspection, Andrew Owens, chief of the Bureau of Violations and Applications, Charles K. Hyde, chief of the Bureau of Inspection of Unsafe Buildings and Fire Escapes, and Samuel T. Webster, chief clerk of the department. The charges are very serious ones, and allege that young Dudley has been guilty of taking and offering bribes and permitting the drawing of public money by appointees who were wrongfully selected, and in the recognition of Inspectors who had not yet passed the Board of Examination and were accordingly not eligible to hold the positions or trusts confided to them. Specific buildings are mentioned where the building law has been violated, and this against the express denial of the Board of Examiners, on those particular cases. The charges cover some forty pages of MS., and the matter comes up for hearing on the 17th I shall not now express an opinion on the merits of the case, which does not come in the nature of a surprise by any means, for common fame has long been busy with the name of the Superintendent of Buildings, and the whole department has lacked the firmness to make itself respected by the general public and feared by the flock of "skin builders" who would cover the city with their wretched shams. W.

THE GLASS WORKS OF MURANO.

These are the most celebrated works, of their class, in Italy, though, for a considerable period, their ancient reputation had been obscured. Some enterprising Italians, however, of recent years, so remarked the avidity with which specimens of old Venetian glass were sought throughout Europe, not merely in the forms of mirrors, mosaics, and enamels, but also in those of colored pearls and false gems, that they conceived the idea of reëstablishing at Murano the manufactures which once made it famous. The town had never, indeed, entirely lost its supremacy in this respect, and still contained a race of artisans to whom the secrets of their forefathers were not altogether unknown. Murano was, in the Middle Ages and during the Renaissance, the great centre whence Europe was supplied with this species of commodity, and with mirrors and ornamental glass, for decorative purposes, more especially. The island on which it stands was favorably situated for commerce with Egypt and the East; it possessed, and still possesses, admirable materials for the fabrication of crucibles and furnaces; brick clay, sand in abundance from the Adriatic shores, and alkalis inexhaustible. So far back as 1383, a decree of the Senate invested it with privileges for the pursuance of this art, "which," it set forth, "must forever be a noble one, and shall find a permanent home here." The manufacture was divided into four classes,— window and rough glass; goblets and blown glass; blow-pipes for bugles, and so forth; and blow-pipes for more delicate and special fabrications. There was a regular administration established, the details of which need not be dwelt upon, seeing that they are mere antiquarianisms now; but one regulation was curious, enacting, as it did, that between the first day of October and the last day of July, — the rest of the year being a kind of close season, — no manufacturer should vary either the number of his crucibles or the processes of his industry. To reach this favored spot, on which none of the dreaded Venetian secret police, or the *sbirri*, were ever permitted to land, the only means is a gondola, which carries the visitor up the canal that forms the "principal street" of the town, and on the banks of which, — the glassmakers' Strand, — the whole of the factories are situated. On each side runs a narrow quay, whereon are landed the raw materials necessary for the works, and whence are embarked the fabrics in their completed state. The least artistic of these, perhaps, though that giving employment to the largest number, is that of those artificial pearls, in amber or agate, which so largely figure in popular Parisian embroidery, though they find a market in every quarter of the world. It was by them, indeed, that Columbus and Cortez originally established a trade between Europe and the Americas, and to this day, in some parts of the East, they, strung on threads, are used as money. The principal interest of the Murano works consists, however, in the process and apparatus of manufacture. The materials employed in making the glass paste are, then, speaking generally, the sand of Pola, the "soda" of Catana, and Egyptian alkali, variously colored with antimony, arsenic, manganese, and minium, though, for tinting the finer qualities, other substances are employed, among them being silver and gold, the latter more commonly. As much as £5,000 worth of it has been consumed by one establishment in a single year. The whole of the materials to be used are first pulverized, mixed, and thrown together to "try,"— in other words, to be calcined in a furnace, whence it is taken and deposited in a close space to cool down to a particular point, the attainment of which is most sedulously watched for. These furnaces are made from what is called, by the Muriani, the "refracting earth" of Cerona, brought from the Friuli Hills, mingled with a kind of sand recently discovered among the neighboring rocks of Schio, and will bear any degree of heat, but they only last for about two years of forty-four weeks each, the remaining eight weeks being always given up to settlements of accounts, and arrangements for the execution of future orders. During the latter time, not a solitary furnace fire is allowed to be kindled on the Glassmakers' Island of Murano. But, while the working season lasts, they are kept incessantly going, rarely needing repair, until condemned and broken up, to be made into new ones. Their dimensions of course are various. Those dedicated to ordinary pearls may contain as many as five large crucibles holding twelve hundredweight each, of material to be calcined, while those for the more delicate varieties, requiring more separate care, require only one, the gradations of temperature, moreover, being different for the different qualities. No coal is used, but only wood, and it is essential that this shall be perfectly dry, to which end special stores have lately been constructed.

The vitreous paste remains in the crucibles from twelve to seventeen hours, according to the specialities of its composition and colors. When once the glass becomes sufficiently malleable to be dealt with, it must undergo a preliminary operation, indispensable to the entire Murano manufacture, and distinguishing it from many others: it must be wrought into long rods, hollow or solid, called by the workmen "canes," and it is from these "canes" that the Muranese glassmaker elaborates the marvels of his art. This process, whether applied to glass or to enamel, demands an almost natural aptitude, — the natives protest that it is their secret, — but at all events, an extreme dexterity of manipulation. The workmen employed upon it are distributed into relays, succeeding each other every six hours, for the laborers must never cease by day or by night. There is in the Murano Museum an example of which the people are naturally proud, as demonstrating the wonderful delicacy of their manipulation, a glass rod, the section of which exhibits a portrait of the late King of Italy in flesh tint, but with hair, mustachios, eyes, and uniform variously colored, and if, says an enthusiast, this rod could be sliced through its whole length, into thin cylinder-shaped pieces, the portrait of the king might be almost indefinitely multiplied. Flowers, animals, innumerable types of decoration, marvellous combinations of color, — pink, black, brown, silver, purple, blue, and so on, — spring from a pure surface of opaque white paste. The sections, however, are far from being invariably round: they are often square or triangular, to furnish ornaments and drops for lamps and chandeliers. Of course, in the imitation of ruby, coral, opal, and so forth, different blendings are necessary; but in all the glass into the composition of which gold enters — as in the red and rose tints; or in silver, as in amber — a second exposure to heat is essential. So with enamels, with the celebrated "Venetian" glass, and that renowned aventurine, discovered by Miotti about one hundred and fifty years ago. This is the substance which the old masters, according to tradition, employed when they introduced vases, chalices, or goblets into their pictures. The elaborate character of the work is suggested by the fact that every pearl sold to children in the streets of Venice has passed through seven different workshops in succession; but machinery bids fair to simplify the processes, — possibly to deteriorate the results. But it is for the nobler branches of the manufacture, — the art, as the old senate styled it, — that the little neighbor of Venice is chiefly concerned, and upon the production of its masterpieces labor and patience little short of miraculous are often bestowed. Examples are known of success after a hundred failures; while, again, the workman who sees that he cannot fulfil his actual idea, but must change it for another, cannot stop to think, — cannot stay his hand; he has instantaneously to alter the design of a swan into a dolphin, or of a rose into a dahlia, or his task is irretrievably spoiled. — *The Builder.*

THE GRAND CENTRAL DEPOT ROOF AND THE WOMEN'S HOSPITAL.

New York.

To the Editor of the American Architect:

Sir, — In your obituary of Messrs. Hatfield and Thomas you have made two rather serious mistakes, one in stating that Mr. Hatfield designed and built the Grand Central Depot roof, and the other in naming Mr. Thomas as the architect of the Women's Hospital. Neither of these gentlemen had anything whatever to do with the plans used in constructing these works.

Mr. Joseph Duclos, constructor of the Architectural Iron Works, designed and built the roof, and Mr. Henry G. Harrison the hospital.

Respectfully, H.

PUBLICATIONS RECEIVED.

Sewer Gases, their Nature and Origin, and How to Protect our Dwellings. By Adolfo de Varona, A. M., LL. B., M. D., of the Royal Order of Epidemics. Brooklyn: Eagle Book Printing Department. 1879.

Second Annual Report of the Society of Decorative Art of the City of New York. No. 34 East Nineteenth Street. Presented January 1, 1879.

Women as Architects. — The *British Architect* says: "Even as it is, lady architects are not so rare but they may be found practising in the quiet of their country homes, both in England and in her colonies. We know of three who have practised so for years, making plans, sections, elevations, details, and superintending the workmen. One, a titled lady, one the wife of a bishop, and the third belongs to the family of a country rector." The social rank of these gentle architects precludes the idea that they practise the profession to gain their livelihood, but there is small doubt that there are in England, if not in this country, women who have a better right to call themselves architects than some male members of the profession.

NOTES AND CLIPPINGS.

THE WATER SUPPLIES OF BROOKLYN AND NEW YORK.—At this time the water question is occupying attention in New York and Brooklyn. In Brooklyn the discussion is waging whether the present system of water supply shall be duplicated at much expense, or whether water-meters shall be introduced, as is proposed in the bill now before the legislature, which seemingly is framed in such a way as to put in the hands of whoever is to enforce its provisions, power so unlimited and arbitrary, as would have delighted Tweed and his associates. New York is also facing the necessity of providing more water, and Mr. Douglas Campbell, in behalf of the Municipal Society, recommends that a commision of citizens be appointed by the governor with power to employ experts, make investigations, and submit a report to the legislature. Incidentally, the question of retaining the reservoir at Forty-second Street is reopened, and Mr. Campbell states that, in case of a break in the Croton Aqueduct, the supply in this reservoir would illustrate the difference between the distress caused by a mere scarcity of water and the distress caused by an absolute water famine. We suppose that the water in the reservoir would supply the whole city but a very short time, even if every one were put on short allowance, but that its retention may some day be of inestimable value is patent, because of the amount of water it contains; for it is said that it would take an artesian well, which a brewer has recently sunk in the city, sixteen months to fill it, flowing as it does at the rate of fifty thousand gallons a day.

THE ALBERT MEDAL.—The Council of the Society of Arts will proceed to consider the award of the Albert Medal for 1879, early in May next. This medal was struck to reward "distinguished merit in promoting Arts, Manufactures, or Commerce," and has been awarded as follows:—

In 1864, to Sir Rowland Hill, K. C. B., "for his great service to Arts, Manufactures, and Commerce, in the creation of the penny postage, and for his other reforms in the postal system of this country, the benefits of which have, however, not been confined to this country, but have extended over the civilized world." In 1865, to his Imperial Majesty, Napoleon III., "for distinguished merit in promoting, in many ways, by his personal exertions, the international progress of Arts, Manufactures, and Commerce, the proofs of which are afforded by his judicious patronage of Art, his enlightened commercial policy, and especially by the abolition of passports in favor of British subjects." In 1866, to Professor Faraday, D. C. L., F. R. S., for "discoveries in electricity, magnetism, and chemistry, which in their relation to the industries of the world have so largely promoted Arts, Manufactures, and Commerce." In 1867, to Mr. (now Sir) W. Fothergill Cooke and Professor (afterwards Sir) Charles Wheatstone, F. R. S., "in recognition of their joint labors in establishing the first electric telegraph." In 1868, to Mr. (now Sir) Joseph Whitworth, F. R. S., LL D., "for the invention and manufacture of instruments of measurement and uniform standards, by which the production of machinery has been brought to a state of perfection hitherto unapproached to the great advancement of Arts, Manufactures, and Commerce." In 1869, to Baron Justus von Liebig, Associate of the Institute of France, For. Memb. R. S., Chevalier of the Legion of Honor, etc., "for his numerous valuable researches and writings, which have contributed most importantly to the development of food economy and agriculture, to the advancement of chemical science, and to the benefits derived from that science by Arts, Manufactures, and Commerce." In 1870, to M. Ferdinand de Lesseps, "for services rendered to Arts, Manufactures, and Commerce, by the realization of the Suez Canal." In 1871, to Mr. (now Sir) Henry Cole, C. B., "for his important services in promoting Arts, Manufactures, and Commerce, especially in aiding the establishment and development of International Exhibitions, the development of Science and Art, and the South Kensington Museum." In 1872, to Mr. Henry Bessemer, "for the eminent services rendered by him to Arts, Manufactures, and Commerce, in developing the manufacture of steel." In 1873, to M. Michael Eugène Chevreul, For. Memb. R. S., "for his chemical researches, especially in reference to saponification, dyeing, agriculture, and natural history, which for more than half a century have exercised a wide influence on the Industrial Arts of the world." In 1874, to Dr. W. C. Siemens, D. C. L., F. R. S, "for his researches in connection with the laws of heat, and the practical applications of them to furnaces used in the Arts; and for his improvement in the manufacture of iron; and generally for the services rendered by him in connection with economization of fuel in its various applications to the Manufactures and the Arts." In 1875, to M. Michel Chevalier, "the distinguished French statesman, who, by his writings and persistent exertions, extending over many years, has rendered essential service in promoting Arts, Manufactures, and Commerce." In 1876, to Sir George B. Airy, K. C. B., F. R. S., the Astronomer Royal, "for eminent services rendered to Commerce by his researches in nautical astronomy, and in magnetism, and by his improvements in the application of the mariner's compass to the navigation of iron ships." In 1877, to Jean Baptiste Dumas, For. Memb. R. S., Member of the Institute of France, "the distinguished chemist, whose researches have exercised a very material influence on the advancement of the Industrial Arts." In 1878, to Sir Wm. G. Armstrong, C. B., F. R. S., D. C. L., "because of his distinction as an engineer and as a scientific man, and because by the development of the transmission of power—hydraulically—due to his constant efforts, extending over many years, the Manufactures of this country have been greatly aided, and mechanical power beneficially substituted for most laborious and injurious manual labor."—*Journal of the Society of Arts.*

A CURIOUS PROPERTY OF HEAT.—Mr. C. J. Henderson has been conducting some experiments lately in Edinburgh with a view to finding out what is the most economical way of heating a public hall, and has decided that the best results are to be obtained by using an accumulator or stove-room, where the heat generated by any means whatsoever is collected, and from which it is discharged through one opening about three or four feet square and seven or eight feet from the floor. The experiments unexpectedly exhibited with what instantaneity and equality heat is transmitted through space independent of the direction in which the entering heated air is moving; for thermometers were placed at the same height on each of the four walls of the hall which was to be heated, and it was found that just as the heated air entered from the stove-room so the mercury in the several thermometers rose, whether they were hung on the same wall in which was the opening to the stove room, or on the north wall, fifty feet away.

AN AMERICAN INLAND SEA.—While Captain Roudaire is making borings and taking levels in the schotts of Algeria, with a view to forming an inland sea in the northern part of Africa, the imitative Americans have conceived the idea of making an inland sea of their own, the place chosen being the desert which now lies between Arizona and Southern California. Into this arid and sandy region, General J. C. Fremont, at present governor of Arizona, proposes to lead the water of the Gulf of California by cutting two canals, one fifteen and the other ten miles long, which are to be connected by a lake which exists midway between the head of the gulf and the basin of the proposed sea, and is itself twenty miles in length. The supposed cost of the undertaking is only one million dollars, a small sum to pay for a sea with an area of ten thousand square miles and a depth of three hundred and fifty feet at its deepest part, and navigable, such is General Fremont's intention, for ocean steamships. Evidence exists that the sea formerly filled this basin, and should it do so again it could hardly fail of having an immediate and direct beneficial effect on the climate of the adjacent portions of California and Arizona, and a consequent ultimate effect on their commercial prosperity. General Fremont is at present in Washington, trying to secure the appointment of a commission to make the necessary surveys, preliminary to presenting the matter to Congress for an appropriation.

DRAINING THE COLOSSEUM.—In consequence of the excavations which have been making in the Colosseum at Rome, water has collected in it very rapidly and has had to be pumped out at an expense so great that, in 1875, the government decided that pumping must be discontinued; since then the water has collected and, being stagnant, has added materially to the unhealthiness of the quarter. It was arranged that one of the sewers which the municipal government is building should be given such a grade that its bed at the point nearest the Colosseum should be below the level of the intended excavations, so as to drain them also. But as it would be several years before this could be done, people made up their minds to endure what seemingly could not be cured. While arranging for the outlet of this sewer, the engineer in charge thought that he could determine near the Arch of Constantine which one of the several remains of sewers which his excavations brought to light had formerly drained the Colosseum, and obtained the authorization of Commendatore Fiorelli, who has charge of the excavations, to explore it. To the surprise of all, the sewer, which was large enough for men to work in upright, proved to be in good repair and so little choked up that to clear it was not a costly work; and moreover it turned out to be the very drain it was supposed to be, so that in a short time a way was opened, and the Colosseum drained itself with a great rush of waters. In the sewer were found the skeletons of horses, dogs, bears, and other wild beasts, various bronze utensils and other articles, and the head of a marble statue of some young Cæsar. All these are to be exhibited in one of the many ambients of the Colosseum itself.

LAKE GARDA.—The bottom of Lake Garda, lying under the shadow of the Alps, is being searched for prehistoric relics. Prior to 1866 the Austrian authorities found some and shipped them off to Vienna, and now Rome has assumed the undertaking.

HANS MAKART.—The appointment of Hans Makart to a professorship in the Academy of Fine Arts at Vienna, where he will have charge of the course in historical painting, once more refutes the belief that a prophet is not without honor save in his own country. It is less than a year since the daily papers were full of disputations upon the elevating or debasing influences of the nude in art, the text for which was furnished by the action of an agent of some society for the suppression of vice, in compelling a picture dealer in New York to remove from his shop window Makart's celebrated picture of the entry of Charles V. into Antwerp, because the monarch was immediately preceded by half a dozen women as naked as Eve. It is possible that this agent may have wished to outdo the good though prudish citizens of New Bedford who, some five or six years ago, forced a tradesman to take from his shop window a statuette of the famous figure of Narcissus. However, so notoriously immoral a city as Vienna has little to lose by honoring so noble a painter as Makart, while Quaker New Bedford and Knickerbocker New York apparently occupy that neutral plane where the exhibition of a work of art in the nude may cost them their fair name, while its suppression may still leave them among the goodly cities of the world.

SCENTED CREMATORY URNS.—An interesting archæological observation has recently been made quite accidentally. It is well known that the urns found in Roman burial-grounds, and containing the bone remains of cremated bodies, are often covered with clay cups or dishes. The object of these dishes was supposed to have been to contain spices, which sent forth agreeable odors during the progress of the cremation. Herr Dahlem, a well-known German archæologist, was able to verify this view in the following manner: He had obtained a dish of this kind which was broken, and, after cementing it, had placed it upon a stove for the purpose of drying the cement. Shortly afterwards he noticed a strong and by no means unpleasant odor proceeding from the heated dish. It seems, therefore, that the ingredients burned in the dish some fifteen centuries ago had left traces behind, which announced their presence upon becoming heated. Herr Dahlem remarks that the odor was not unlike that of storax.—*The Nation.*

THE RESOURCES OF THE FRENCH ACADEMY OF FINE ARTS.—L'Académie des Beaux-Arts has a yearly appropriation of $1,000 for the members who have charge of the Dictionnaire des Beaux-Arts, and $2,000 for its publication. Besides this, it distributes about $1,200 in medals for those who win the Grand Prize of Rome, and for the performance of cantatas.

THE UNPLEASANT CONSEQUENCE OF A TASTE FOR MOSAICS.—It is narrated of Diogenes the Cynic, that he was one day the guest of a man whose house, according to the fashion of the time, was decorated with mosaic. Being shown at length a room whose mosaic pavement represented a convention of all the gods, he turned and spat in the face of his astonished entertainer, remarking by way of explanation and excuse, that in all the room it was the only ignoble spot he could find whereon to relieve himself.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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ONLY a fortnight ago we spoke with satisfaction of the reforms which Mr. Dudley, the Superintendent of Buildings in New York, had effected within his department, and it is rather embarrassing to find that this gentleman and several of his subordinates are now undergoing an investigation on charges of serious malfeasance in office. The affidavit contains twenty-seven distinct charges, seventeen of which affect Mr. Dudley either individually or in conjunction with his subordinates. The minor offences with which he is charged are: appointing certain unnecessary though salaried officials; appointing as inspectors six improperly qualified men named in the affidavit; permitting the erection of buildings whose substructures did not justify their height; and practising as an architect while in office. The graver charges are: conspiring with his predecessor, Mr. Adams, and others to obtain the office of Superintendent by bribing Mr. Adams to resign the office before his term of service had expired; misapplying in various ways the moneys appropriated by the city for the use of the Department, but especially by using certain sums, together with his own salary and money raised by levying unlawful assessments upon his subordinates, to influence legislation; receiving voluntary bribes, or levied black-mail, from persons named, for allowing repairs and alterations to be carried out in violation of the building law; winking at the non-destruction or repair of condemned buildings and the omission of fire-escapes and iron shutters ordered by the Department; and, finally, imitating the late Boss Tweed in a way which to avoid misapprehension we give in the words of the affidavit: "And deponents further say, on information and belief, that the said Henry J. Dudley gave to builders and others erecting buildings, his check and checks on banks wherein he kept no account, and his individual notes, and received from said builders the money on said checks and notes and appropriated the same to his own use, and has not taken up or paid such checks or notes, and the same still remain unpaid; that said checks and notes were never intended to be cashed or paid, were illegally given, and were intended to, and did, bring scandal on the Department."

MR. DUDLEY, who is an Englishman by birth and an architect by profession, desires that his conduct while Superintendent should undergo the most thorough scrutiny, and emphatically declares that the charges brought against him are without foundation. He has made known to newspaper reporters his defence against certain of the charges, and as they are apparently valid, we think it right to repeat them. He says that the reason he is charged with practising as an architect is, that he has been confounded with his father, Mr. Henry Dudley, who was the architect of all the buildings specified; that the six inspectors were not appointed by him, but, being capable men, were retained in office, though they were not subjected to an examination, as a clause in the charter exempted from it the then incumbents of offices; and that several of the persons named as having given him money had notified him that they were willing to make affidavit that they had never paid him either bribe or black-mail. His defence against the other charges will appear as the investigation proceeds; but this, as each of the accused parties is to have a separate examination, is likely to last some time. The facility with which men will put their names to a paper without reading it, merely because some one else has signed it, or because they are asked, is curiously illustrated by this case, for it appears that three at least of the five subscribers to the affidavit, who are reputable builders, did not know or care what they were signing; one thought it was a simple call for an examination of the books of the Department, and another thought that his signature was to help a friend, or rather a customer, to obtain civil damages from Mr. Dudley. The real instigators of the investigation are Mr. James M. Macgregor, a former Superintendent of Buildings, and Mr. Hardenburgh Tallman, whose scandalous effrontery in continuing to completion, in spite of every effort of the Department of Buildings, a very marked case of jerry-building, was detailed by our New York correspondent in our issue for December 7, 1878. This fact known, the case at once loses much of the political significance which usually attaches to such investigations in New York. But the fact that he may be the victim of private malice and personal vindictiveness will not relieve Mr. Dudley from the necessity of meeting and explaining every one of the very serious charges which have been brought against him; for the citizens of New York are not altogether averse to dealing summarily with a misdemeaning official now and then.

IT would be difficult to find surroundings more deadening to the sensibilities, more uncongenial to art, than are to be found in any New England factory town, with its regular hours, its ceaseless clatter and confusion of sounds, its population with minds all intent on one thing, and its monotony of unsightly buildings; for somehow or other picturesqueness, or even grace, and utility are thought to be quite incompatible when it is a question of building a cotton or a woollen mill. To the architect more than to any one else such a building is an eyesore; to him it represents the minimum of result and almost the maximum of wasted opportunity. Knowing it for the work of the builder and the engineer, he knows too that its unsightliness is not essential to its strength or to its serviceableness. He can recall scores of engineering structures which are at once pleasing to the eye and useful, and he wonders how it happens that all owners of mills are affected by the same unappreciativeness of architectural effect. If he inquire diligently, he will find that the responsibility rests not wholly with the owners, but in a great measure with the underwriters who insure them against fire loss. They have formulated the conditions which a mill must fulfil before they will accept a risk on it, and having found them to be such as master-builders and engineers can fulfil to their satisfaction, they have discouraged, intentionally or unintentionally, the employment of architects. They even go so far as to themselves provide plans and specifications. This hostility to architects, which is a fact to be regretted rather than complained of, is not, to be sure, felt by all insurance companies; for there are wild-cat companies, in the scheme of whose operations the aleatory element is given prime consideration, so so that an architect's mistake is as often a matter of profit as of loss. In the East, at least, the responsibility for much of this bald work rests with a combination of seventeen mutual fire insurance companies, which make a specialty of insuring mills. Without reflecting on the propriety and wisdom of the regulations which these companies have established, we can express the wish that they may find it possible hereafter to take a more liberal view of the architectural needs of mill buildings.

WE have before us a statement of some of the results and conclusions reached by the Boston Manufacturers' Mutual Fire Insurance Company through the experience of the past twenty-eight years in insuring mill property in New England and parts of the Middle States. Opening with the statement that the seventeen companies already mentioned, which make a specialty of insuring buildings of this class, have taken risks on more than two and three quarter billion dollars' worth of property, and have paid fire losses amounting to more than six million dollars, it makes several interesting statements, one of which — and a more powerful argument in favor of fire-proof building it would be hard to find — is that the average annual fire loss in the United States, together with the cost of maintaining the fire departments and the insurance companies, amounts in round numbers to $130,000,000, — a sum which, it says, "constitutes a tax on the nation that is distributed on all production and consumption, and can be saved only by such radical changes in the

methods of construction and supervision as have constituted the real secret of the success of our mutual system of preventing fires. About two thirds of this annual tax on the community could be saved if churches and warehouses were constructed as safely and watched as carefully as cotton and woollen mills now are. Such a saving would be equal to a relief from the interest on the national debt." More interesting to the architect than the statements of the number of fires with the resulting losses, and their bearing on the profits or losses of the company, is the list of the causes of fires which destroyed these buildings in whose construction such special care is taken to avoid fire loss. Here we find that the most frequent causes of fire are: foreign substances in the picker, friction, and spontaneous combustion, — causes which can find a cure only in constant watchfulness. From the list of miscellaneous causes, such as the overturning of a lamp or the careless use of matches, no special conclusion can be drawn. But when out of a total of three hundred and eighty-five fires, three fires caused by defective flues, one by the ignition of wood in contact with a brick boiler-setting, five by the contact of wood with steam-pipes, and one by heat radiated from a metal furnace, while two small fires in the pickers developed into destructive fires because of inadequate fire-doors between the mill and the picker, are the only ones which can be laid at the door of defective building, it must be acknowledged that unsatisfactory as the system is in its architectural results, it meets the demands for safe construction very successfully. Perhaps we should also lay at the door of the builder the one fire whose cause is stated as "moral hazard suspected," — an entry which we do not understand.

The statement that two hundred and seventy-nine of these fires were extinguished by the use of pails, small mill hose, and chemical fire extinguishers, while one was "mopped out with a wet broom," suggests how much loss might be saved if it were possible to attack the fire shortly after it has started. This matter is receiving much attention just now in London, where the universal testimony is that the Fire Brigade does not usually get to work on a fire before fifteen minutes have elapsed; whereas the late Mr. Braidwood, the chief organizer of the Brigade, laid it down as an axiom that, to be effective, fire-escapes and fire-engines must be at work five minutes after an alarm is given. The city of London proposes to abandon its present cumbersome system, with its divided responsibilities, and to adopt the system practised in Manchester, Liverpool, Glasgow, and other provincial cities, where hand and steam fire-engines, which have been the sole reliance in London, are used on about three per cent only of the fires which occur. To take an actual example: steam or horse engines were used on only three of the two hundred and ninety-one fires which occurred last year in Manchester, and though the value of the property imperilled was over nine and one half million dollars, the actual loss was less than two per cent of this sum. The system in vogue in these English provincial towns is to have many hydrants, each provided with a hose, at points between the stations of the Fire Brigade. Each policeman has a key to these hydrants, and at an alarm it is his duty to get out the nearest hose and attack the fire at once; so that seldom have more than two minutes passed before a good stream is directed upon the fire, and so the first minutes are not wasted. At a trial before a committee of the city corporation at Manchester, the Brigade obtained nine jets of water through one thousand yards of hose in four minutes, the alarm being given from the principal station. In a second case a fireman at a sub-station got a stream of water in one and one half minutes, the hydrant being near the station. In the third case a fireman ran out the hose-truck and got a stream through seventy-five yards of hose in three minutes after the alarm. In default of this system, which has much to recommend it, Americans are doing something to perfect their own, one of the latest improvements having been adopted lately at a Boston engine-house, where the men sleep on trap-doors which fall at the first stroke of the alarm, and they find themselves in their proper places on the engine before they are fairly awake.

The new galleries of the Museum of Fine Arts, in Boston, completing the front, and nearly doubling the amount of available space, were this week opened to the public. They consist of two rooms for sculpture, three for paintings, and two for engravings, besides a large room for architectural casts, and a room for Greek vases. These collections will be put in place early in the summer. Meanwhile, the Museum has permitted the Boston Art Club to enter in and occupy the picture galleries, with an exhibition of contemporaneous art, American and foreign, which is held in lieu of the Club's usual spring exhibition at its own rooms; while the Boston Society of Architects, which is the Boston Chapter of the Institute, and the various schools which are housed in the Museum, occupy the rest of the new space, with exhibitions of their own. Tickets were issued for the opening reception on Monday evening to nearly four thousand persons, and though more than half of them reported in person, there was room for all. The excellence of the pictures, the extent and picturesqueness of the building, the great interest excited by the work of the schools, and the good-will of the company, combined to make it an unusually brilliant and successful occasion, full of promise for the future. The good sense and public spirit shown by the authorities of the Museum on this, as on other occasions, is appreciated by the public as well as by the institutions with which it enters into these friendly relations, and will doubtless further its prosperity as much as they already enhance its usefulness.

The pictures, especially the American pictures, seem to be of better quality than is often found on such occasions; and the show of architectural designs, though mostly, of course, the work of Boston architects, and unusually free from *ad captandum* drawings, is full of interest and instruction. In the lower rooms the School of Art-Needlework, for women, the School of Carving and Modelling, for women also, with evening classes for men, and the School of Drawing and Painting, show how much the Museum is doing for education in art, simply by furnishing a soil congenial to their growth. An interesting feature of this part of the show is a collection of work done by students in the Pennsylvania Museum, at Philadelphia; the Cooper Institute, in New York; and the Yale School of Fine Art, in New Haven. The work of the architectural students of the Institute of Technology, comprising the chief part of the drawings so handsomely noticed at the Paris Exhibition, last summer, were hung with the other architectural work.

One of the curiosities of the political economy of the present time in this country is the rapid development which, in spite of long-continued business depression, has been given to the fine arts and the industries which are generated and fostered by their growth. The Centennial Exhibition encouraged it much. The movement began before the Centennial; but the spirit of emulation which was excited by what was seen at Philadelphia will not entirely explain why individuals and whole communities, who are as parsimonious in their ordinary expenditures as if restrained by the strictest sumptuary laws, should be so openhanded when an object of art is to be purchased, or a museum or school of art is to be supported. A more tangible proof of the same proposition is the fact that during these dull times the book-trade has been less affected, it is said, than almost any other. Relying on this open-handedness of the public and individuals, the Trustees of the Metropolitan Museum of Art, in New York, now that they have moved their collections from the building on Fourteenth Street to the new museum in Central Park, have asked from the citizens of New York one hundred and fifty thousand dollars, that they may, in the first instance, purchase the Avery collection of porcelain and the King collection of gems, and may then increase the scope and usefulness of the museum by adding to it casts of antique and modern sculpture, architectural models, and casts of other executed work of special interest; by establishing industrial collections which shall show the raw product passing through the different stages of manufacture, and models of the machines used in the processes — all of which seems to us quite too much to compress into one museum; by opening a school of industrial art; by initiating a series of lectures on art; by instituting a system of awards and medals for work of exceptional merit; and by the purchase of objects of archæological interest. All this is to form the permanent background for a series of loan-exhibitions of painting, sculpture, bric-à-brac, or what not, after the manner of those established at South Kensington; indeed, the museum is to be conducted on essentially the same scheme as the famous English museum. In view of what is to be done, the sum asked for is not a large one, and we hope, now that the Trustees have appealed to the public for specific aid, that New Yorkers will show themselves more liberal toward their museum than they have been in the past.

THE SEWERAGE OF VILLAGE-CITIES.[1]

THE city of Taunton, Mass., with a population of about twenty thousand, occupies a slightly undulating plain on Taunton River, — a small tidal stream, with a mean rise and fall at ordinary tides of 3.41 feet. The tide ebbs and flows to a distance of about six miles above the city, at which point there is a dam. The area to be drained is about sixteen hundred acres, covering the present and clearly prospective area of the city. The soil is generally a stiff clay, or is underlaid at slight depth by a stiff clay. The "city" characteristics are confined almost exclusively to the form of government. Physically, socially, and financially, it is and promises to remain a large manufacturing village of the better class. It has a public water-supply, and is lighted with gas, but its streets are mainly those of a country town rather than of a city. Its houses are generally detached, and many of them have considerable grounds. The inclination of the area to be drained is nowhere steep, and the Sewer Committee in describing the needs for drainage do not include an experience of injury from surface flooding as an argument in its favor.

Their arguments, however, based on other grounds, are exceedingly strong and to the point. They include worse than imperfect sewers and drains, constructed with reference to no consistent plan; the discharge of these drains into a small mill-stream which runs through the city; the discharge of other drainage into small brooks, and of still others into swampy lands; the wide prevalence of cesspools and privy-vaults of all degrees of badness, and such a saturation of the heavy subsoil as leads to wet cellars and bad roads. Concerning the mill-stream it is said: "Manufacturing waste, domestic sewage, drainage of public institutions, stables, and gas-works, privy deposits, garbage, and surface washings have here found a common bed, either to be distributed slowly along its banks or left to putrefy on its muddy bottom, exposed by the withholding of water at the dams above the city, breeding and sending forth poisonous gases and offensive odors in our very midst."

The foregoing states briefly the problem which this committee had to solve, and states it fairly so far as their own report has stated it clearly. In its solution they adopted the wise course of calling in professional assistance, not being themselves experts in the matter. It was the engineer thus selected to whom the real solution of the problem was entrusted. His plan, simply stated, is to lay sewers at a considerable depth, the smallest being 12-inch pipes. and the largest a brick sewer 66 inches by 60 inches, having its mouth about half closed at low tide and entirely closed for some time at high tide. The intermediate sizes are calculated for the removal of moderate rainfalls, — the water of heavy storms escaping through "storm-overflows."

If Taunton were, or were probably to become, within the future which an engineer need regard, a compactly built city like Boston, with paved streets, and if it had steep grades, we might accept his minor sewers as suitable. If it were situated on the high bank of a great river like the Hudson, we might accept his main sewer as well. But Taunton has none of these conditions, — neither the necessities of the one case nor the possibilities of the other. It is simply a large and nearly level village with a very bad subsoil, with very difficult conditions for the removal of its filth, and with a comparatively insignificant tidal creek to receive its drainage.

To sum up our case at the outset, we object to the proposed plan, from beginning to end, for these reasons: —

1. No small industrial community like Taunton can afford to pay $750,000 to $800,000 for a system of sewerage if it can satisfy its *sanitary* needs and its want of *soil-drainage* for one third the money. In this case the other two thirds — or about half a million dollars — is needed only to remove the water of only *moderate* rains.

2. The proposed sewers, especially the smaller ones, would very generally be "sewers of deposit," — offensive and dangerous to the public health.

3. The delivery of the sewage of a town into a main sewer which, for over a mile of its length, has its bottom covered with dead water at low tide, — and for a mile and a half at high tide, and of which the whole mouth is closed at every high tide, must inevitably lead to the deposit of putrescible matters and to the consequent production of unwholesome conditions.

4. The delivery of foul sewage into such a stream as Taunton River, at such a point as has been selected, violates the best established requirements of sanitary drainage.

5. "Should chemical or other treatment become necessary," a condition which the Report contemplates, it would be impracticable (for such a town) to treat the volume of sewage which their sewers are calculated to discharge; and a matter of burdensome cost to pump such an amount to the surface of the ground.

So far as our brief space allows, our meaning may be more fully explained thus: (1.) While the cost of the proposed sewers might easily be assessed upon abutting land in a city, where the whole front is occupied with costly buildings, such assessment in a country town would be extremely onerous. The excessive cost in this case is due to the effort to remove the water of ordinary rains through underground channels. The water of the heavier storms, those which alone might cause any considerable destruction to property, it is not proposed to admit to the sewers. Were all or nearly all rainfall excluded, and were the sewers reduced in size, within reasonable limits, to the capacity of the actual household and manufacturing waste, the cost of the work would be incomparably less. The sewers are placed much deeper than there is any present or probable need for anywhere, except in a city where deep cellars are used. Much of this depth is due to the inordinate size of the sewers. (2.) The engineer's Report emphasizes the importance of a certain velocity of flow. We are thrice told, with reference to calculations of grade and size, that the assumed velocity of the flow is dependent on the sewers *running half full*. The given rate is 3 feet per second. This for a 12-inch sewer running half full would require a fall of, say, 4 inches in 100 feet, or 1 in 300. A 12-inch sewer, at a grade of 1 in 300 and running half full, would discharge nearly half a million gallons per day. Let us take the very large estimate of sixty gallons per day per head of population, — rainfall being excluded, — as the amount of sewage to be removed. It would then require a population of over eight thousand persons to fill this sewer half full, supposing the flow to be uniform, day and night. If we assume that one quarter of the daily flow is discharged in three hours, then the sewage of about six thousand persons would fill the sewer half full at least once a day, which would suffice for flushing purposes. Six thousand persons would probably occupy about twelve hundred houses, and, theoretically, it would require this number of houses to furnish sewage enough to keep the 12-inch pipe in good condition. Under the arrangement proposed, the flushing would be tolerably adequate during the season of frequent rains; but during dry weather deposition and decomposition would be inevitable. (3.) The Report says, concerning the rise of the tide into the sewer, "This, however, is rather an advantage than otherwise; for it is a well-established fact that sewers are kept cleaner by the ebb and flow of the tide than where there is no such action." Mr. Robert Rawlinson, the best authority on this subject, says: —

"When an outlet sewer is liable to be back-watered, it will be advisable to keep the invert up as much as possible, even at the expense of the gradient, as it will be better to have a level invert and depend on flushing rather than have an invert backwatered daily, during which period the sewage must be stagnant and must also be depositing silt. Suppose the range of tide is 20 feet vertical, and a main sewer is taken by a regular gradient from high-water down to low-water level, it must be clear that such a sewer will practically have no fall at high water and will be impeded during the entire tide." Mr. Bailey Denton expresses the same opinion concerning the tide-locked outlets of Liverpool and Brighton.

The Taunton outlet sewer would fill with heavy silt to the level of low water — more or less, according to the frequency of storms and according to the deposition between the low-water intervals — and would constitute an elongated cesspool more than a mile long, manufacturing sewer-gas from end to end and filling the whole sewer system of the town with a dangerous atmosphere. (4.) There are grave objections to discharging sewage matters into any tidal estuary, where the tide sets up past the town, — to say nothing of the rights of riparian owners further down the stream. In the Report the following quotation is made, — its application to the proposed outlet not being noticed: "Thus, while the crowded population is relieving itself effectually and economically of its refuse and waste materials, it is turning them over, in the shape of defiled water, to the injury and abridgment of the rights of every riparian owner." To discharge this sewage six miles below the head of the tidal movement and in a stream where, during protracted droughts, there is a material diminution of fresh water flow, is to insure future trouble at home and abroad. (5.) A reservation is made concerning chemical or other treatment, and the small size of the sewers is excused by saying, "only sewage of a limited volume would be delivered to the tanks or the farm, and the same results would be obtained at far less cost than if the manurial elements were further diluted by the entire flow of heavy storms." The engineer's conception of "limited volume" may be computed thus: He adopts for the size of the last 2,500 feet of his main sewer 66 inches by 60 inches. According to Latham's tables, a circular sewer 5 feet in diameter will discharge, at an inclination of 1 in 2,400, 156,660 cubic feet per hour, so that during the moderate rain for which this sewer is calculated, a tank of one acre in area — which would be a very large tank for chemical treatment — would be filled 3½ feet deep in an hour. The discharge is below high-water mark, so that, whether for chemical treatment or for irrigation, this whole volume of sewage must needs be raised, by artificial pumping, at the rate of 81 tons per minute!

In making the following statement, the summer condition of the proposed minor sewers, and the constant condition of the great outlet conduit, must have been lost sight of: "In its sanitary results, the superiority of a sewer which continually keeps itself clean, over one which does not, is incalculable." This idea reappears frequently throughout the Report. Such a Cloaca Maxima is justified by saying that it is in contemplation to make a great intercepting sewer 27 miles long to take the sewage of Glasgow to the sea. It is true that this prodigious scheme was recommended by Sir John Hawkshaw, but the city authorities have decided upon an immediate discharge into the Clyde after deposition and chemical treatment. The method of sewer ventilation recommended — by perforating the iron covers of the man-holes — is inadequate. Simple perforations are of little avail, even when not clogged with dirt, as they generally are; nothing short of open gratings will suffice.

The Committee evidently count on material aid from the State, in consideration of furnishing an outlet for the sewage of the State

[1] *Report of Special Committee on Sewerage for City of Taunton*, 1878.

Lunatic Hospital, and they recommend that, with its aid, there be built at once the main sewer from the Hospital wall to the main outfall, at a cost of $114,100. The Hospital sewage amounts to only 50,000 gallons per day, or — if one quarter of this amount is discharged in 3 hours — to about 70 gallons (less than 10 cubic feet) per minute. This quantity would not half fill a 6-inch pipe laid on an inclination of 4 inches to 100 feet, and the needs of the Hospital, were its flow to be more than double what it now is, would be better served by a 6-inch pipe than by a larger one. The cost of such a vitrified pipe from the Hospital wall to the outfall point, laid below the reach of frost, and laid in the very best manner, would not now exceed $2,500. As the grade of the lower part of the line is very flat, it might be necessary to use cast-iron pipe from High Street. This would add about $1,300 to the cost.

We have gone thus fully into this discussion, because the case under consideration is an entirely typical one, and because the questions at issue affect all country towns. The plan proposed for Taunton is in accordance with the general practice of the best sewerage engineers. But our best sewerage engineers have gained their experience and formulated their theories in the treatment of paved and closely-built areas. In our opinion their successors, even in the largest cities, will vastly modify the present practice as they themselves have modified the practice of their predecessors. Whether or not the present system is the best for cities, we are not now discussing. We are very sure that it is by no means the best for country towns, and that it is in fact entirely inapplicable to them, as much on the score of health as on the score of economy. Let our country towns first get rid of their foul sewage and their soil water and leave the question of surface wash to be settled when, if ever, it becomes of sufficient consequence. Health and economy first, — gigantic engineering long afterward.

NOTICE OF THE SECOND COMPETITION IN INTERIOR DECORATION. (*Second Series.*)

The subject of the second competition is a sideboard in the dining-room of a retired manufacturer, whose former employés have presented it to him with a view to its displaying a full silver dinner service (which is not necessarily to be indicated), also presented by them. It is placed between two windows, and opposite the fireplace, and its ornamentation, which is to be properly subordinated to its general design, is to indicate the manufacture in which the gentleman acquired his property. The extreme length of the sideboard is not to exceed nine feet, and its height must be less than the height of the room, which is fourteen feet.

To the competitor the interesting features of this programme should be the manner in which he may contrive to illustrate a trade or manufacture in his decorations, and how he may most effectively set forth the service of plate. With one, and possibly two exceptions, these opportunities for design have not been fairly availed of by the competitors. Although in the invention of a piece of furniture of this sort no very exhaustive demand is made upon the higher qualities of architectural composition, no result approaching satisfaction can be reached without the exercise in some degree of nearly all the technical resources which must be possessed by the architectural designer. The sense of proportion, scale, and fitness, the knowledge of detail, the use of mouldings, the subordination of parts, the adjustment of expression to the characteristics of the material employed, — all these qualities which are called into play in the designing of a great façade have their function in the making of even so commonplace a thing as a sideboard. The best furniture of the best period of the Renaissance was formed by such architects as Philibert Delorme, and was eminently architectural in its character. When the high architectural traditions were forgotten in the designing of furniture there followed the extravagances of the Rococo and the *bombé*, and this branch of art became debased and vulgar, the victim of mechanical method and styles. It is by the judicious aid of minds trained in the larger problems of architecture proper that furniture is to be purified in its lines and improved in its artistic expression. The cabinet-maker without such guidance must inevitably fall into mere caprice and become incoherent. It is, therefore, no condescension for an architect seriously to study such problems as are proposed in this programme, and the young designer in especial, if he is wise, will keep his project within the bounds of conventional forms, and will not allow his imagination and fancy to get the upper hand. His besetting sin is the desire to be original rather than correct, and the result, as exhibited in nine tenths of the designs submitted in these competitions, is the same sort of crudeness and illiterateness (although of course in a different degree) which the common carpenter in his turn exhibits when he attempts decorated architecture on the basis of his native inspirations. The safest course is to remain loyal to the commonplace formulas of architecture in the beginning, to make them consistent with the construction and the material, and to be content with refining upon compositions thus securely based. A greater freedom of design, a bolder scope of invention, will come in due time, and will have grammatical expression, but not before the student has been so thoroughly exercised in the rudimentary and common forms that the sense of architectural fitness and proportion becomes an instinct. The architect is the conservator of traditions. It is his business, as the leader of all the arts of decoration, to keep the fundamental ideas pure and correct; it is not to hasten but to guide and control their progress. All these arts, whether of glass-painting, mural decoration, the designing of stuffs and furniture of all sorts, nay, even of needlework and embroidery, must from time to time turn to him, not so much for new inspirations as for refreshment and correction. It is a matter of prime importance for the architect to design furniture with the feelings of an architect, and not with those of a cabinet-maker.

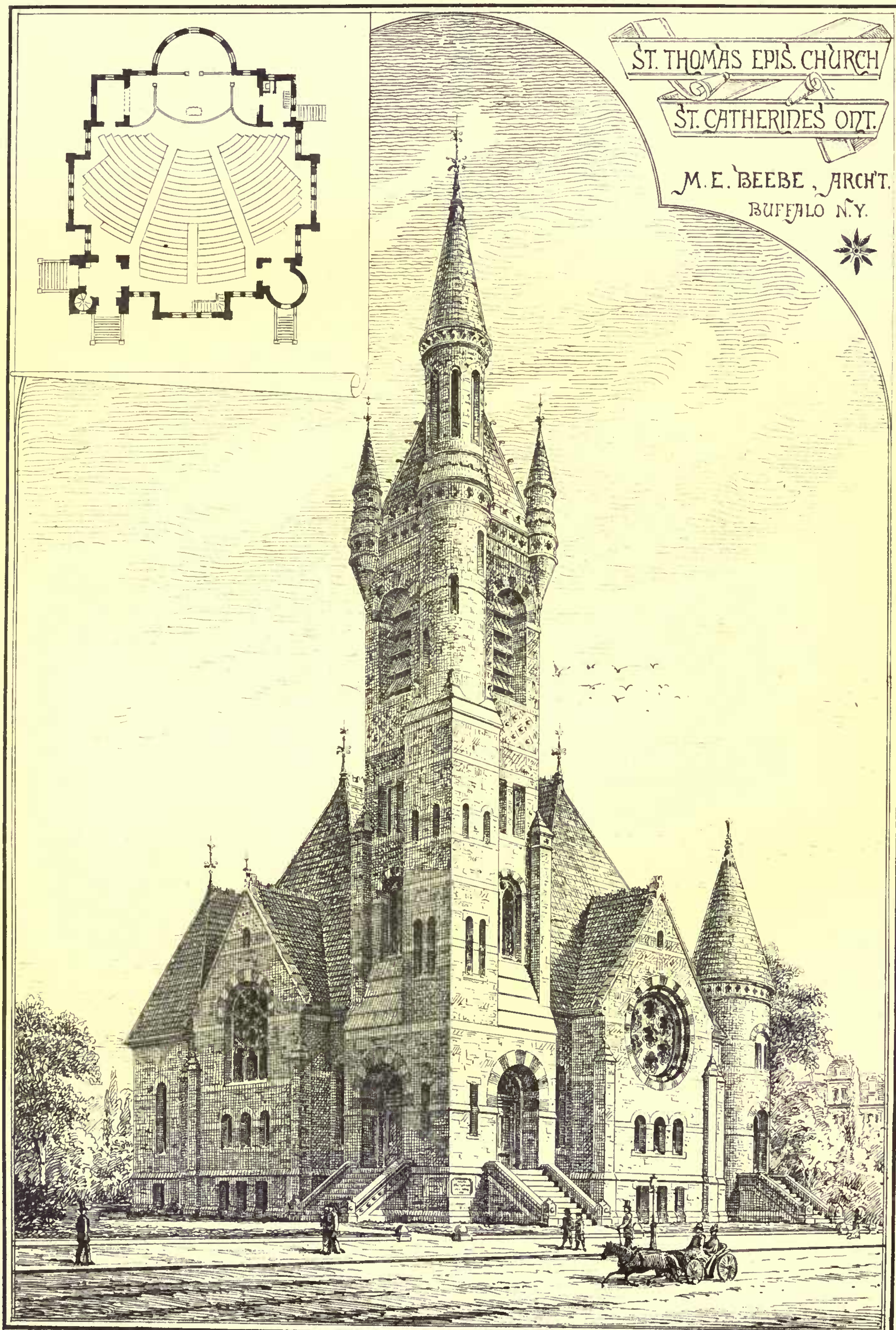
Perhaps one of the most carefully considered and most intelligently developed of the studies in the present competition — that of *Dry Goods* — is a proof that a 'prentice hand may sometimes make an essay with original ideas without rendering himself ridiculous. If so, this would be the exception which proves the rule. But the points of originality in this design are by no means the best points. Thus the open niche under the main shelf of the sideboard is out of style, badly composed, and too capricious in its motive; objects placed in this niche would be invisible from ordinary points of observation. The open backs of the light flanking pavilions are of questionable expediency, as would be betrayed by a perspective study; the objects placed upon the shelves should have a fixed constructional background, and should not be exposed to the accidents of color and form which would be presented by the wall treatment behind. The decorated panels, however, are well designed, well drawn, and appropriate, and the use of bobbins in the little columns is not without ingenuity. The composition is harmoniously divided, and has good lines, and the scale of wood-work is well preserved. The elevation omits to break the base mouldings around the lockers which stand upon the main shelf.

The best point of the design of *Lynn* is its judicious loyalty to architectural motives, which are used with discretion and self restraint. The consoles and panels above the upper shelf should have been raised a few inches upon a plinth to have their full value in the effect of the design. The composition has not a little dignity, and the curving back of the locker in plan above the main shelf is a device which gives play of light and shade, and has its practical use. But the scale of the elevation is quite too small for the design; an inch and a half to the foot would have been nearer correct than an inch, which makes the main shelf four and a half feet high. There is no especial significance introduced into the decorative panels, and as a piece of furniture intended for a particular purpose, — to serve as a monument, as it were, — this is not a success. But it is a fair design in itself, and the perspective study, if its details were but a very little more clearly defined, would be an excellent line sketch; it has sufficient freedom of manipulation, and is not without brilliancy and breadth.

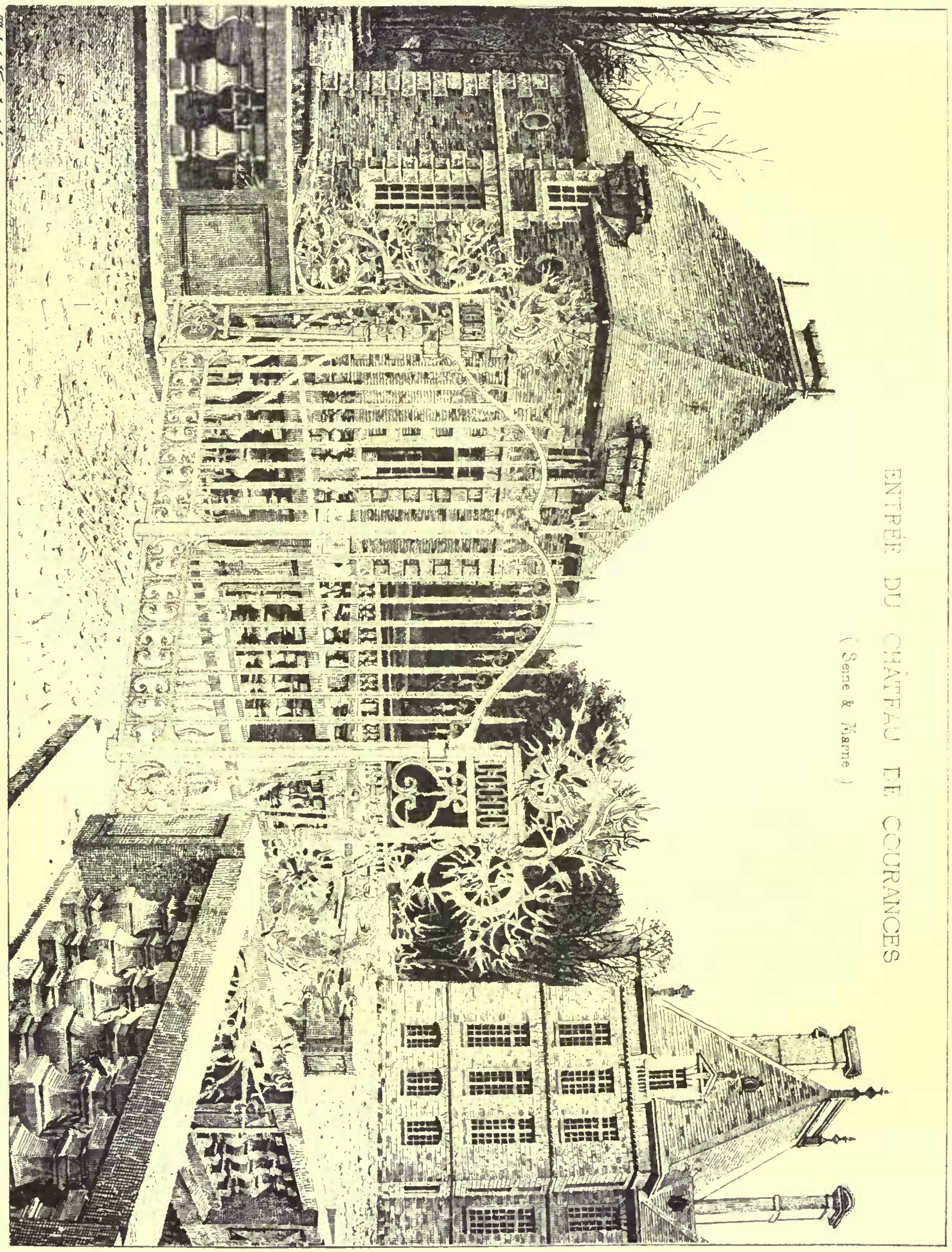
The contribution of *Clay*, on the other hand, which is dedicated to an earthen-ware manufacturer, is abundantly enlivened with illustrative groups in niches, and with panels of tiles showing the processes of manufacture, so that there can be no mistaking what it is all about. Moreover the architectural composition is thought out with much care and invention, and the whole is harmoniously divided both horizontally and vertically. It is quite an ambitious performance, and deserves a good word. It is open, however, to these points of technical criticism: The main shelf so overhangs the central division of the base that, from any usual stand-point, nothing of the little arcade by which the base is decorated (and which, by the bye, is too light for the superstructure) would be visible, except the shafts, which, if they must be twisted, should turn in opposing directions. The supporting consoles are well designed, and so are the panels at the ends of the base; but the designer has been unfortunate enough to enrich the only moulding of the principal shelf, which cannot be seen. The niched flanking pavilions of the superstructure should have been projected forward slightly from the central division, and the little order of columns which decorate this division should have been closed at either end with its own pilaster or anta. The frieze and cornice are too heavy for all the rest of the design; this, perhaps, is the main defect. A drop-like excrescence is used upon nearly all the supporting brackets. This is capricious and unreasonable. The lettering is hastily and carelessly done, and there are several errors in spelling which contrast strangely with the literate character of most of the artistic work on the sheet.

Persevere gives us a study with some original points quite temperately presented, and with a good outline. The main shelf gives us the whole area of the sideboard for the display of plate; in this respect he has gained a distinct advantage over all his competitors, and it is one of sufficient importance to subordinate all other features of the sideboard, as is really the case with this design. A heavier horizontal member over the main shelf would have supported the locker above more comfortably. The perspective justifies the main points of this bold and pretty little composition; but the details are wanting in refinement and knowledge, though the scale seems to be fairly understood; and the main cornice in the elevation is better composed than in the perspective sketch, which does not conform to it. The corner columns in the base should have been heavier, and the little balustrade should have been lower; its function of protecting objects from falling is a forced one at best, and would be fulfilled by a feature of half the height. The drawing is wanting in firmness and decision of touch, and does injustice to the idea.

Double Elephant sends a contribution in outline with good elements in it, but his drawing leaves much to be explained. We will give him the benefit of the doubt, however, and suppose that his flanking pavilions are open and have a panelled backing, and not closed with a



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ENTRÉE DU CHÂTEAU DE COURANCES
(Seine & Marne)

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close-panelled locker. The drawing admits of either interpretation. This feature would go far to redeem a design which has many grammatical faults, chief among which is the curious absence of a horizontal moulding or string above the glass doors of the central locker. The panelled space above this is not accounted for, and seems to be lost. If the flanking pavilions do not break through the entablature, but are intended to stop under it, they should have been furnished with a small crowning moulding of their own. But the balustered posts are excellently well detailed, and the entablature is a good specimen of classical wood-work delicately and discreetly composed. A perspective study is much needed to illustrate this design, which, but for such points of oversight as we have named, and for various signs of weakness in the design and execution of detail, would have made a formidable figure in the contest. It has, however, no indication whatever of individuality, as required by the programme, — and the decoration of the niche-heads and spandrels is bald and cheap.

The design presented by *Cunctator* also sorely needs to be illustrated by perspective or by shading. Much of it admits of several interpretations, and some of it is quite unintelligible. Enough, however, is clear, to show that this competitor is not at present in a fair way to occupy the proper position of the architect with reference to the decorative arts, as we have endeavored to explain it in our introductory remarks. For his composition is full of injudicious caprice and a straining for novelty of effect, which is not justified by any evidence of familiarity with the common processes of architectural design. *Cunctator* would fly while he is yet callow. His principal shelf is far too high, and divides his composition horizontally into two equal parts, — a fundamental error. His posts are inexcusably capricious and excessively extravagant, and most of his details are illiterate. There is nothing which shows how the design is appropriate for use in the house of a glass manufacturer. We commend to this aspirant a careful study of the simpler elements of design, and earnestly counsel him to avoid any attempt at present to be original. To be correct is a far more important objective point.

Fiat Justitia does not himself do justice to the programme; for he presents us with a cabinet and not with a sideboard. The design might more easily be adjusted to contain a small organ. It is quite too formal and monumental in character for our present purposes, and is overloaded with the vulgar and conventional embellishments of the cabinet-maker. The first practical requirement of a sideboard is to furnish abundance of shelf room, — and especially with a broad, open lower shelf or table. This design is wanting in this essential respect, and is not adaptable to the proper setting forth of plate and glass. Even preserving its main architectural details and its somewhat too ponderous outline, the few alterations and additions necessary to adapt it to our present needs would make a fundamental change in the appearance of the design. This competitor has misdirected his energies, but evidently, if started aright, with the determination of designing more like an architect, he could make a more fitting appearance in such a contest as this.

Cæcus also needs an illustrative perspective sadly, or some judicious shading in order that the composition may exhibit whatever virtues it possesses in a more effective manner. As it is, he can scarcely himself have any idea how it would appear in execution. His study is another example of vaulting ambition which o'erleaps itself. It is full of novelties, but wanting in knowledge; it is coarse where it should be delicate and bold where it should be self-restrained. The superstructure greatly overpowers the part below the main shelf. It would be infinitely improved by omitting the line of panels below the impost line. In outline the design is quite too tall for its width, and the immense buttresses over the flanking pavilions which support the central gable are too coarse in their lines, and are not justified by any interest in their detail. The notion suggested in the base is capable of interesting treatment, and is not without merit in its present setting forth. But the rest of the design is far too original to be good and far too ambitious to be really a useful experience for its author.

Espérance, with a heavy hand and an unfortunate parsimony of detail, gives us in unexpressive outline a panelled wall with a sideboard of monumental proportions adjusted to it. So far as we can understand it, this piece of furniture is not without merit in its intention, but, as it is not explained by any sections or side elevations, our imagination has far too much play. The scale is too coarse for the work, — very much too coarse, — and there is not enough thought bestowed by the author upon his design to justify any prolonged criticism of it. The mouldings should be more delicate, the detail more considered and refined, and the whole brought to a scale commensurate with the chairs and tables by which it must be accompanied. The attempt to harmonize the sideboard with the architectural decorations of the room by treating it with the same order is to be commended; but the order should be modified to suit the conditions of structure and use. Though this design is made the last in our list it would by no means be the last if its motives were properly developed.

THE ILLUSTRATIONS.

ST. THOMAS'S EPISCOPAL CHURCH, ST. CATHARINE'S, ONT. MR. M. E. BEEBE, ARCHITECT, BUFFALO, N. Y.

THIS building, which is now nearly finished, was commenced in the summer of 1877; it is built entirely of stone. Size about 80 by 100 feet; cost $25,000. T. Sullivan, contractor, St. Catharine's, Ontario.

DESIGNS FOR A SIDEBOARD. COMPETITION NO. II.

The award of the jury will be announced in our next issue.

ENTRANCE TO THE COURTYARD OF THE CHÂTEAU DE COURANCES.

We reproduce this illustration from the *Croquis d'Architecture* of the Intime Club.

CORRESPONDENCE.

THE UNION LEAGUE CLUB-HOUSE COMPETITION.

NEW YORK.

WHEN the Committee on Design appointed by the Union League Club came to their work of selecting one from the dozen or more designs sent in, the task resolved itself into a very simple one. And once familiar with the accommodation offered by each, the committee with one voice fixed upon the design of Messrs. Peabody & Stearns as the one most suitable in their judgment to the wants of the club. Should this selection be confirmed, and the award be given to the Boston firm, it will, in a measure, offset the Trinity Church, which was built in Boston after the designs of New York architects. For several days past the drawings have been on exhibition in the art-gallery of the club, and the members have been busy criticising in a curious sort of way the judgments of the architects upon the needs of the club as expressed in the drawings. There are elevations with plans, sections, and perspective in each set. The first act of the committee after their appointment was to invite nine firms to send in drawings. These were as follows: James Renwick, G. E. Harney, Potter & Robertson, E. E. Raht, Richard M. Hunt, S. D. Hatch, McKim, Mead & Bigelow, C. D. Gambrill, all of New York, and Peabody & Stearns of Boston. Mr. Renwick sends in two designs, and, besides, a couple of designs have been offered as voluntary contributions by Thorp & Price, and another one by West & Anderson. The nine firms invited are paid the sum of $250 each, except of course the winners, who are to be employed and commissioned as the architects of the structure. The requirements of the club were set forth in a circular sent to each of the architects. This was very general, and alone would not have been much of a guide. About six weeks' time was given for the preparation of the drawings, and considering the problem this was none too long. The designs now on the walls, however, show a great deal of study. The plot, 84 by 152 feet, was to be covered as fully as possible, so as to give this large club its reading-room, library, billiard-room, café, bowling-alley, hall, art gallery, and dining-room, with the necessary servants' and service rooms. About $200,000 were to be spent on the structure, and while the lucky architect could never hope to avoid the harsh criticisms of an active minority of the club, to do something satisfactory to the majority would be a successful and creditable feat for any member of the profession.

Glancing around the room where the elevations and perspectives were hung, while broad tables held the plans and sections, I could readily select the authors even before the names were legible. Mr. Hunt was apparent in the severe style which served well in the Lenox Library, and is here again introduced with a few concessions toward club life. Mr. Renwick tried a Gothic treatment, as well as something more formal, but they were rather irreverently criticised by many of the laity present. Messrs. Potter & Robertson are as precise and attentive to detail as though it were a gate-lodge or a college memorial hall they were designing. Messrs. Gambrill & H. E. Ficken make a very strong pair of designers, and had they paid more attention to the plan would no doubt have pushed the Boston firm hard. It seems almost a pity that something of this exterior could not be adapted to the Boston plan, and thus the best result attained. Mr. Harney has an out-and-out Queen Anne design, which would suit to a nicety some wealthy Knickerbocker club, anxious to keep up the memory of their Dutch ancestors. It is the most homelike structure of any on the walls, and notwithstanding its size has a real cozy look and feeling. Mr. Raht is as precise as may be, with lines and angles as clean cut as any in the Coal and Iron Exchange building. Mr. Hatch is meagre, and his design has a pinched look, and does not fairly present the possibilities of the problem. Mr. McKim has a very peculiar design, which manifests a curious notion of club life in New York. There might have been good reason for such a contrivance had the club been situated in an Italian city, but such a hanging garden would be a deserted domain for ten months of the year, and during the other two months the club men are not in town. The unsolicited designs evince the wisdom of the committee in not soliciting them. Messrs. Thorp & Price have not treated themselves fairly in the designs to which they have affixed their names. Mr. Thorp in his Racket Club did honest work with a legitimate building material, but his club-house seems designed on the conventional model for an English town warehouse or store, and the club members embodied this verdict in very direct language. The Potter & Robertson design hangs next to that of Gambrill & Ficken, and here may be studied the best of the New York plans. Both indicate an appreciation of what a club-house should be, and show that mixture of publicity and the privacy and comfort of home with somewhat of pretentious show. It is not to be repellant or cold; conspicuous enough to invite public attention and criticism, while it does not seem to extend an invitation to the casual stroller to walk in, as a museum, a church, a library, or a theatre might; it is to be something more than a grand private house, which a certain number

of individuals propose to hold with common privileges. These characteristics are manifested in the design of Messrs. Potter & Robertson in a somewhat formal way, and in the Gambrill outlines more freely. The plans, however, of these designs failed to meet the approval of the committee, and they were laid aside. Before passing on to speak of the winning drawing there is a design at the other end of the room which deserves a word. It was prepared by Messrs. West & Anderson, and has a tower, and has a combination of coarse emphatic features, which would possibly suit the building committee in a Western town.

The design of Messrs. Peabody & Stearns is intended to be executed in brick and Belleville stone; but what the outside may be is of comparatively small consequence, as it will no doubt be modified to suit the notions of the building committee, even if the sober second thought of the architects does not dictate the many changes which are necessary to tone down the rather strongly marked lines of the elevations. It can hardly be styled a homelike structure, and though the club is an active political body at times, and makes itself very prominent in the public eye, there is a quiet retiring side to the life of the club, which will hardly find this exterior a congenial one.

In their Queen Anne outlines the architects get what no formal style would permit, — a freedom to arrange the elevation to meet the exigencies of the plan, and it is very easily seen in the Boston plan that the interior has dominated over the exterior; that a home for the club has first been laid out and then some attention has been paid to inclosing the desired arrangement of rooms in an appropriate dress.

The entrance is from 39th Street by a shallow porch which opens into a good-sized hall. This story is not particularly high. It is the lounging story. The reading-room, or ogling apartment, whence the club men can observe, through its broad windows, the fair promenaders on the Avenue, is on the Avenue front. It extends the entire length of the lot. At the opposite side of the hall and at the other end of the building is the billiard-room and smoking-room; adjoining it is the coffee-room, and below in the basement are the bowling-alleys, and not as in another plan on the Avenue front directly below the library. Access to the story above is by a broad staircase well arranged for effect, opposite the main entrance. This story is a much more lofty one, and is occupied by the library over the reading-room, while over the billiard-room is the hall, or theatre. To the left, and between the entrance and this meeting room, is the art-gallery, running back to the rear, and lighted from above. This divides the building, and the great shaft which lights it affords air and ventilation to the upper stories as well. In connection with this hall and art-gallery a special feature of the plan is to be noted, an extra entrance, made inconspicuous and placed between the club entrance and the billiard-room. A staircase runs from it to the top of the building. The first flight is broad and easy of ascent, and should the hall be hired out temporarily, or the gallery thrown open for any exhibition, the visitors would use the extra doorway, and reach the hall or gallery without in any way interfering with the regular habits of the club men, who would not find the club invaded for the nonce by a flock of strangers. Another feature which caught the eye of the committee was the use of sliding doors in the library. The usual alcove plan is followed, and between each bank of double shelves, doors are arranged; by drawing them out the library may be cut up into a series of small book rooms. For meetings of committees this might at times be very useful.

The next floor is devoted to chambers. It is low, and a bridge or entry leads over the top of the art-gallery, breaking the continuity of the sky-light, and allows access to the chambers over the meeting hall. This story is really the last one in the main building, for at its ceiling level the main cornice is fixed, and above it the great roof begins, and here on the fourth story is the dining-room. This has been made a special study, and many good points have been gained, though to many New Yorkers the idea of a dining-room on the fourth floor will appear somewhat of a novelty. But broad stairways, and especially convenient elevators, give easy access to it, and its position permits a treatment which it could not have in the lower stories. It is over the library end of the building, extending north and south along the Fifth Avenue end, and with the west exposure. In height it extends through two stories, or rather the ceiling, which is somewhat an open-timber one, is permitted to run up into the high mansard, and with the upper dormer windows the room has a line of lights along one side after the manner of clerestory windows. The serving-room at one end is in two stories; the upper one is connected with the kitchen, which is thus on the fifth story, entirely clear of the members' portion of the club, and almost certain to give no offence. Other chambers fill up the fourth and fifth floors, and servants' quarters are here provided. There are scores of points where evidences of study can be noted when the plans are under inspection. For instance, on the library floor, the opportunity for a fine vista through the whole one hundred and fifty feet of building has not been lost, and from the Avenue windows of the library the line of sight extends across the hall and the gallery to the opposite wall of the theatre. There are many chances for fine effects in a minor way, and while there is in a measure a want of repose and absence of dignity in the interior, it is capable of being made an eminently comfortable and satisfactory building for club purposes, and for this club in particular. The cost of such a building is estimated at $217,000, and with such modifications as will be made in the exterior, it will be a real addition to the architecture of the city, though such an one as will provoke much critical comment. Were one disposed to draw sharp lines between distinctive styles and temporary fashions in architecture, some sharp things might be said of the Peabody & Stearns design.

There is little doubt but that the club will ratify the action of its committee, and operations will be opened on May 1, by tearing down the riding shed, which now encumbers the corner selected as the site. W.

THE RECENT LOAN EXHIBITION. — VARIOUS CHAPTER MATTERS. — THE JOHNS HOPKINS HOSPITAL.

Baltimore, April 13.

The Art Loan Exhibition in the rooms of the Peabody Institute finally closed on Saturday last, having continued open for about five weeks. As has been stated, the object for which the exhibition was gotten up was — besides throwing open to the public a very interesting and instructive collection of miscellaneous objects of art — to collect funds, one fourth of which was to go to the Decorative Art Society and the residue to be appropriated to the purchasing of pictures for the foundation of a permanent gallery at the Peabody Institute. Considering certain difficulties and restrictions to be encountered in the disposition of the rooms, the general arrangement was, upon the whole, as satisfactory as could be expected. Two similar exhibitions, held within the last five years, have been financially great successes. They had, however, a charitable object in the background as a *raison d'être*, and offered certain side attractions in the way of restaurants and floral temples to beguile the inartistic public. These additional attractions were all omitted in the present case, and the public showed themselves neither so enthusiastic in their interest nor so generous in their support of an exhibition of pure art.

Nearly one half of the oil paintings were exhibited and offered for sale by New York artists, and although there were some very good things among them, the whole collection proved much less interesting than that on the opposite wall, which was devoted to pictures chosen from various private galleries in the city, among which were a number that would rank high in any modern collection. In the room devoted to the Rhinehart casts was a small collection of water-colors, with some half-dozen exceptions, however, not above mediocrity. The Decorative Art Society, in an alcove of its own, made a fair exhibit of needlework and china-painting, some of the most beautiful specimens of the former being contributed from Boston and New York.

The large bric-à-brac room was very attractive in its general appearance, and contained many very beautiful and rare and valuable things, but, although it was perhaps unavoidable, the overcrowding and unintelligent arrangement, and total lack of classification of the objects, was to be regretted. A large pyramidal stand with many fine bronzes upon it occupied the centre of the hall. Two cases of very beautiful and interesting portrait miniatures were specially noticeable, and distributed through the room were a large number of very perfect specimens of nearly all the well-known porcelain manufactures of Europe and the East. Caldwell of Philadelphia had the most conspicuous exhibit, from which he sold a large number of articles to amateur collectors. Tiffany exhibited some few, though very exquisite specimens of his beaten silver ware, — old watches, and reproductions of antique jewelry. A number of cases were appropriated to the special use of private collectors of this city, and filled from their own cabinets, generally showing good taste in arrangement, and containing articles of rare value and beauty, though in some instances remarkable for some romantic history or interesting incident, conspicuously placarded, connected with its acquisition, rather than for real artistic merit.

One of the objects that attracted most attention in this room was a bust in white marble, Christ bound with Cords, by a young artist, a Jew by birth, and a native of Richmond, Virginia, who has been studying for some years abroad, and whose works are said to have been very favorably criticised in Paris and Berlin. The treatment of this bust is a wide departure from the conventional and long familiar one, and represents perfect robust manhood, with a strong Jewish type of feature. The work is far above mediocrity in conception and treatment, but the impressions produced upon different persons as to the prevailing feeling expressed in the face were very varied. The bust was purchased by the person who formerly purchased the Clytie from Rhinehart, and gave it to the Peabody Institute, and who was also the owner of a number of the best pictures in the exhibition.

The Walters gallery did not lend any of its treasures to the exhibition, but for one morning was thrown open by its owner with a very delightful reception and entertainment to a number of invited guests, and for several days afterward by special tickets to the public. The room of Oriental porcelain, bronzes, and lacquer ware is bewildering in the wealth of forms and colors collected in so small a space, and needs frequent visits of many hours to be calmly appreciated. The disposition of the picture gallery is altered materially in the last year by some valuable additions, among which are three De Neuvilles, the Surprise at Dawn, occupying the place of honor most deservedly. Most striking among the new acquisitions are the Waning Honeymoon by Boughton, Suicide by Decamps, Corpus Delecti by Boks, Wood Scene by Diaz, and Mud Pies by Knaus.

At a meeting of the Chapter a few weeks ago the hour for meeting was changed from eight in the evening to five in the afternoon, in order to insure a larger attendance, and a Committee on Programmes was also appointed, to arrange for providing some interesting paper to be read at each meeting. One paper entitled National Types of Domestic Architecture, illustrated by plans, has already been read. At the same meeting an animated discussion arose as to professional practice, particularly as regards the adherence to the schedule of charges set forth by the Institute, which was considered by some as impossible in a community where the "intelligent and practical mechanic" is so frequently preferred to the "theoretical and artistic" architect; and facts and opinions were freely acknowledged by some of the members, which to others were quite a new revelation. An effort to again urge the City Council for action upon the building law was deemed inexpedient during this session, though it was hoped that the decided move made by the plumbers in that direction might be more successful, owing to their greater influence in city politics.

The extra four dollar assessment from the Institute meets with as much disfavor here as elsewhere, not one member of the Chapter as yet having consented to pay it. Business in several offices is decidedly more active this spring, the work consisting chiefly in city and country residences, moderate-sized churches, and some few warehouses. The foundations have been begun on Charles Street for the new building of the Wednesday Club, whose monthly "musical and dramatical" soirées have been for several years among the most popular social entertainments ever given in the city. As it is said the building will only cost $25,000, it must necessarily be simple in plan and inexpensive in finish.

A walk through the buildings of the Johns Hopkins Hospital, even in their present unfinished condition, proves highly interesting. Specially to be noticed just now is the thorough system of ventilation and heating, the fire-proofing of ceilings, etc., by the use of Tiel blocks, now manufactured in Baltimore, the disposition of the various wards and their dependencies, the deep excavations and massive masonry of the kitchen building, the excellent working of the Cheat River bluestone used for finish, and the very thorough workmanship and attractive style of finish about the roofs, chimneys, etc. What has been done is still only the beginning, as several years' work will be needed before the institution can start actively upon the good work for which it is intended. J. N. W.

THE COMPETITION FOR THE WASHINGTON SCHOOL-HOUSE.

To the Editor of the American Architect:

Dear Sir, — The Commissioners of the District of Columbia, in their advertisement, to which you refer in your paper of last week, have offered to all architects a premium of $500 for the best competitive design for a public school-house having certain specified accommodations. Its cost is not to exceed $30,000; drawings to be made to the scale of ¼ inch to the foot, to be submitted on or before May 1, with "specifications and detailed estimates," and all plans submitted to become the property of the district, "to be used or disposed of as the commissioners may think best." Seven practising architects of the city of Washington forthwith united in a protest addressed to the Commissioners, declaring that they were willing to enter into any fair and reasonable competition, but that the terms of the one proposed as above, unless modified to the extent that all plans to which a prize is not awarded be returned to the persons submitting them, "are too onerous to be borne, and must have been imposed upon the commission by some designing person." The natural inference is that these gentlemen considered that the clause proposing to retain the drawings — which clause, you inform us, the Commissioners refuse to withdraw — is the only objectionable feature in the advertisement. So long as decent members of the profession in every community are ready and eager to expend their money and time and the best fruits of their experience and study upon propositions so ungenerously and, as we think, so unintelligently conceived as this of the district commissioners, even with the amendment suggested by the architects, so long will building committees continue to angle with these specious and cruel flies. Indeed, they are furnished by the architects themselves with all the justification they could desire. We can hardly blame men of business for thinking lightly of a profession upon which such exactions can be laid, and for availing themselves of the privilege of choice among wares so cheaply offered. Thus, if a dozen architects are willing to lay at the feet of the Washington commission a series of designs carefully studied out and drawn at a scale of a quarter of an inch, with specifications and detailed estimates for this school-house, at a cost to the architects of several thousand dollars, and to the commission of only five hundred, the benefits of the bargain are all on the side of the commission, of course, whether they keep all the designs or not. It might have been supposed that for the sake of the very great advantage of comparing various thoroughly detailed projects, set forth with a most unnecessary and entirely premature expenditure of unremunerated labor upon working drawings and full specifications, without which detailed estimates cannot be furnished, the commission would have been willing to yield the almost nominal point demanded by the architects in this case. But even if the architects had obtained the modest concession which they asked for, the fundamental wrong which they will do themselves and the profession by entertaining such a proposition at all will remain. The only remedy is systematically to decline so to prostitute professional labor, and to make diligent use of every opportunity which offers to mitigate these arrogant, or, if not arrogant, these illiberal, or, if not consciously illiberal, these ignorant demands continually made upon the profession of architecture. The report of the Committee on Professional Practice regarding competitions, published by the Institute in pamphlet form, and available to all architects on application to the Secretary, is a serviceable tract prepared to meet just such emergencies. If members of building committees can be induced to read it, it may be presumed that, as men of business and men of honor, they will scarcely venture so grossly, and with such unnecessary exactions, to tempt the cupidity or the impecuniosity of architects. Respectfully, H. V. B.

THE EFFECT OF HEIGHT ON VERTICAL DIMENSIONS.

To the Editor of the American Architect:

Dear Sir, — In inviting designs for the Washington Monument from architectural students, it would be advisable to invite also criticism, and thus properly ventilate all the good and bad points which should be kept in view in designing, and save a large amount of misdirected energy on impracticable designs, and facilitate the best solution of the problem.

This is an economic age, and the character of every design must be determined by its adaptability to its assigned purpose and conditions, as well as the possibility of executing it within the probable funds at the disposal of the authorities, or the utmost expenditure which they are inclined to countenance. Another consideration often overlooked is the crowding in of small features and details at high altitudes, which cannot possibly be discerned from available points of sight, and cause therefore a useless expenditure of money. Some time ago I observed in the yard inclosure of the new Chicago Custom-House and Post-Office some elaborate stone-carving of small detail and fine workmanship, which I understood was intended for a feature at a high elevation on the building, in which position it could not possibly be seen from the street; and the leaves, etc., were carved so thin and of such fragile stone that rain, frost, and ice would soon destroy them. This was an unpardonable waste of money.

The difference between the apparent and the real heights of vertical parts of a lofty structure at the higher angular altitudes is easily found by scaling the chords which represent the apparent heights of stages, stories, features, etc., and the radii equal to the base, or distance between an assumed point of sight and the vertical axis of the monument; which radii are then extended in position to the vertical axis, or to cut vertical lines of elevation, to obtain real vertical dimensions for purposes of construction, estimates, etc. Or in dealing with a high composition like the proposed monument, the trigonometrical method is precise, for a few main divisions: for instance, given an angular elevation of 10° above the horizon, and a base of 500 feet, the vertical height would be 88 feet; whereas the apparent vertical height of 88 feet, the visual angle being 10°, and the angular altitude between 35° and 45°, would be 150 feet real height, the angular measurements indicating the visual angle at which the various parts of an object are presented to the view of the spectator. For information of young students, the above and other like problems are obtained thus. In tables of natural tangents $10° = .17633$, which $\times 500$ feet base $= 88$ feet.

$$\text{Then N. T. } 45° = 1.00000 \times 500 = 500 \text{ feet.}$$
$$\text{" } 35° = .70021 \times 500 = 350 \text{ feet.}$$

$$\textit{i. e.} \ 10° \text{ at } 35° \text{ elevation } = 150 \text{ feet.}$$

This increase of real over apparent dimensions at the higher altitudes is independent of aerial effects of distance and of receding and oblique parts; also of surroundings, backgrounds to the most available points of view, etc.

The linear effect of increase of horizontal distance is to diminish the apparent height and width in inverse ratio, — the visual angles subtending an object being contracted to a half at double the distance from the point of view.

Another consideration is to provide ample substructures to carry the superincumbent dead load, as well as the additional load and strains produced by hurricane and storm pressures, and by the use of elevators, etc., and by chance unequal distribution of loads caused by unequal settlement of foundations and piers, whereby a surplus ultimate stress may be shifted on to the firmer and better resisting parts. Also to allow amply for cutting into piers for joists, girders, arch skewbacks, and other structural devices, and other incidentals likely to affect the security of the structure; and to remember that the security of a structure depends on the strength of its weakest parts. Such contingencies sometimes arise from changes and alterations (and omissions under careless supervision) which were made as the work progresses, and were not originally contemplated, and which are sometimes done at the instance of a crotchety or stupid superintendent, and perhaps are not discovered until too late to be remedied. Also to provide materials of safe bearing resistance, with ample margins of strength for all contingencies of careless or slovenly work. If I recollect aright, I think I observed, several years ago, that some of the marble facing of the present shaft is somewhat chipped at the bearing edges, which may be due to the unequal settling of the facing and the backing of the structure.

Yours respectfully, Alex. Black.

NOTES AND CLIPPINGS.

Strengthening the Foundations of the Washington Monument. — The work of strengthening the foundations of the Washington Monument, for which Congress has appropriated $100,000, is progressing slowly and carefully. To undermine, even by ever so little, a mass weighing some thirty-two thousand tons, so insecure as to need such reinforcing, is, of course, a delicate operation. Work can be done on only one tunnel at a time, until after the pressure shall be supported evenly near each angle and the middle of each side. The tunnelling of one of these trenches, which are each four feet wide, though their depth is unknown to us, takes about two days and a half, and another day's work is needed to fill it with the Portland cement concrete, in whose preparation every care is taken. This is laid in layers six inches thick, each layer being pounded into a solid and homogenous mass before the next course is put in. When the tunnel is nearly filled it is subjected to a final ramming, and liquid cement is forced into all unfilled crevices through a pipe subjected to pressure. In this way eight of the seventy-two trenches have been filled. "When all these trenches have been dug and filled," says a Washington paper, "the base of the monument will be incased in a foundation of stone, resting on incompressible sand, and its weight will be distributed over 15,876 square feet, instead of 6,400 square feet, as at present. This new base will extend eighteen feet under the outer edge of the foundation, and five feet under the outer face of the shaft at its lower joint. The centre of the monument will also be supported by a mass of concrete, the excavations for which will be made when the central trenches are dug, as the latter will be carried from one side of the monument to the other. To lock the old foundation with the new, and distribute the pressure more uniformly, a supporting mass of concrete, like a continuous series of buttresses, is to be carried from the upper surface of the new foundation up and under the outer portions of the shaft."

A Collection of the Old Masters in Peru. — *Le Temps* contains the following curious letter, which gives an account of a remarkable collection of the old masters at Lima: "Who would believe that Lima, which has no museum of the fine arts, has, nevertheless, a private collection by the side of which many an European gallery would be colorless? A collection of more than eleven hundred paintings, the greater part of them signed by the noblest names of the Spanish, Italian, Flemish, Dutch, and French schools? Yet there is nothing more true than the existence of this extraordinary collection; the proof is that I have seen it, and this is what I saw: In one of the oldest houses in the city there lives a hospitable gentleman, Don Manuel Zaballos. Whoever knocks at the door of his house is well received; but I ought to say that generally none but strangers ever present themselves. The Peruvians seem to be ignorant of the Collection Zaballos, doubtless because they have none too much time to admire their female compatriots. In the first room are a hundred small Spanish and Italian paintings, perfect gems in their way. The master shows us, with a certain off-handedness, three admirable Murillos, and, although we are inclined to speak more at length of this Magdalen, this St. John, and this Descent from the Cross, he leads us into his Salon Carré and confronts us with a Zurbaran well known to, or at least much sought after by, connoisseurs, the Ecstasy of St. Francis; on the right are two superb Rubens, on the left a Van Dyck; on every side hang haphazard, in tarnished and worm-eaten frames, Raphaels, Claude Lorraines, and Paul Potters. In the next room is the same profusion of chefs-d'œuvre in the same disorder; the schools are a perfect jumble; the subjects injure one another; here and there the frames overlap; but still here are the names of the same great artists. Before these canvases, blackened, smoke-discolored, ill-arranged, our doubts vanish; our feelings of astonishment and admiration are better guaranties of the authenticity of the signatures than the signatures themselves. Finally we enter a gallery where there are perhaps fifty paintings; the middle and the two ends are occupied by three paintings, three chefs-d'œuvre: the Communion of St. Jerome — 'But,' you will say, 'you are poking fun at us, my fine fellow; the Communion of Saint Jerome by Domenichino is in the Vatican; every one has seen it there, every one can still see it there. Because you are in Peru you think you can tell us fine' — Pardon, in my turn; I am very sorry for the Vatican, since the Communion of St. Jerome which is there is only a copy of the original, which is here. Do you wish a proof of what I affirm? Look at the Death of St. Jerome, at the other end of the gallery, by the same Domenichino, which has never been copied, as far as I know, and you will agree that it is difficult to be deceived when you have before your eyes two St. Jeromes in the same tone and almost in the same attitude. Let us move on. Here again is the first of Raphael's virgins; here is a battle piece by Salvator Rosa, as fine as that in the Louvre; three (life-size) equestrian portraits by Velasquez; some Tinttoretos, at least as fine as those in the Ducal Palace at Venice. Next is a complete collection of the Flemish School, with Teniers, Van Ostades, Gerard Dows enough to excite the envy of the Museum at the Hague; there are besides three Rembrandts. Whoever would study the Spanish school, too little known, would do well to come here to study it. He would see here a Cano, that Spanish Michael Angelo, representing the Birth of Christ, where each figure is a complete picture in itself. There is not a great name which is not represented by two or three canvases, not a picture which is not full of life, movement, passion. In short, we leave this house wonder-stricken, enchanted with our discovery, and envious of Don Manuel's good fortune in being able to study these masterpieces at all hours. But before we leave him, he surprises us once more. Taking from an old Louis XIII. bureau a sheet of yellow paper, he says, 'I am always grateful to the strangers who come to see my paintings, but I only preserve the names of those of my fellow-citizens who visit me. Here is a list begun six years ago, and see, there are not yet fifty names!'"

The French Exhibition Building. — It is said that the French Cabinet has decided to retain the façade of the main building of the Exhibition facing the river. The remainder of the site will again become a military drill ground.

The Boss Bricklayers' Association. — About a month ago an association with the foregoing title was formed by twenty-three sub-contractors in St. Louis, who were dissatisfied that the percentage of profit made by the contractor for the whole work should be so much greater than their own. The members have pledged themselves not to make a tender for a sub-contract until the bid submitted by the contractor has been accepted.

The National Gallery, London. — During the year 1878, 902,162 persons visited the galleries of the National Gallery in Trafalgar Square, the average being 4,978 for each of the one hundred and eighty-eight days when they are open to the public. Care was taken to note what pictures were most frequently copied, with results which are quite as interesting and unexpected as the statistics as to the popularity of different authors which the librarians of our public library gather. Thus, of the older masters Greuze seems to be the most popular, for his Portrait of a Young Girl was copied fifteen times, and his Young Girl with an Apple was reproduced by seventeen students; while the Praying Madonna had twelve admiring imitators. Amongst the more modern masters, Reynolds heads the list with twenty-two copies of his Angels' Heads, and twenty copies of the Age of Innocence. Turner's Téméraire was reproduced twenty-one times, and Romney's portrait of Lady Hamilton, sixteen times.

The Channel Tunnel. — The preliminary investigations which it is necessary to make, before the actual work of constructing the tunnel is begun, are still pushed by the French with much activity. Lately attention has been turned to examining the bed of that part of the English Channel under which the tunnel must pass. Up to the last of February, 7,791 soundings had been taken, the depth varying between one hundred and two hundred metres. The lead brought up 3,207 geological specimens. Over a distance of twenty-eight kilometres (17 2-5 miles) identical results were obtained in 1,525 cases, which seems to indicate that the tunnel, which will be thirty-six kilometres (22 miles) long, will be driven through sound gray chalk.

A Famous Tobacco-Box. — There was recently exhibited at two of the city clubs a box which belongs to the Past Overseer's Society of the Parishes of St. Margaret and St. John, Westminster, called "The Westminster Tobacco-Box." So remarkable is its history that not only has the Society of Antiquaries held discussions over it, but it has been honored by a personal "reception" by her Majesty. This box, or rather the original, — for it is composed of no fewer than seven boxes in one, and *the* box is the smallest of them all, — was only an ordinary horn "baccy" box, the gift of one of the Overseers of St. Margaret's to the convivial club to which he then belonged, in the year 1713. The members were delighted with the gift, and recorded their appreciation by a silver rim affixed to it in 1720. This little bit of silver appears to have worked wonders, for every successive parochial officer of St. Margaret's or St. John's also affixed a silver plate and rim, the subject being of either parochial or national interest, and when the box became covered other boxes were built around it, so that at the present time, to the ordinary oval box four and one half inches long by three and three quarters inches wide, of three quarters of an inch inside depth, and thirteen and one quarter inches round, six other boxes have been added, the last being octagonal in shape, about five feet round and three feet high. While the first or original box only weighs some ten ounces, the last weighs nearly half a hundred pounds, the whole seven weighing about twice as much. Each silver plate represents some parochial or national event of interest which has occurred during the year of office of the donors; the first of the series being a representation of the battle of Culloden in 1746 — a design, it is said, by Hogarth; and the last three the proclamation of the Queen as Empress of India, the erection of the Cleopatra Needle, and the loss of the steamboat Princess Alice, the cases thus representing at one view one hundred and thirty-two years of national history. — *London Times.*

A Simple Night Clock. — Lamps are constructed in Paris so that they indicate the time during the night. The oil is contained in a tall, narrow vessel, placed vertically, and connected at the bottom with the wick of the lamp. This vessel is graduated, beginning at the top with VII. After one hour's burning the level of the oil will be at VIII, and so on. The lamp burns with perfect regularity, and a reflector is so placed as to throw the light on this cylindrical dial. The level of the oil, which can easily be seen, always correctly indicates the time. — *La Nature.*

Plumbing Hints. — It is said that lime has a very injurious effect upon lead pipes when it rests upon them, and is kept moist or even damp. Cases are reported where pipes have been eaten through in a very short time under basement floors where the plasterers had swept their rubbish. — A mixture of equal parts of plaster of Paris and powdered pumice-stone makes a useful casing for articles that are to be soldered or brazed.

The Lightning-Rod. — The St. Louis Academy of Sciences has been throwing light upon the lightning-rod, concerning which, said Professor Nipher, there are many popular delusions. One is, that if one of two rods containing an equal amount of metal be hollowed out, thus giving it greater expanse, its conductive power would be greater than that of the other. The truth is that they would be equally as good conductors. Another erroneous impression which the professor proceeded to dispel was, that a current of electricity runs along the surface of a wire. In reality it extends through the entire wire when the circuit is made, Mr. Nipher said, but when the circuit is closed, it accumulated upon the surface of the conductor. A strong point made was that lightning-rods do not attract lightning. They are splendid conductors, much better than wood or air, and lightning strikes them because they offer the least resistance to the passage of the electric current. It makes no difference whether a point be on a lightning-rod or not, so far as the protection of buildings is concerned. The positive electricity in the earth will flow along the wire and accumulate at the point, if there be one, making the tension and the conducting power greater and enhancing the probability of lightning striking that rod in preference to another which has no point, but has the positive current disseminated through it equally. — *New York Tribune.*

Hungarian Bricks. — One reason why the recent flood in Hungary was so fatal to life is said to be the fact that the bricks of which most of the houses were built were not made of hard burned clay, but of lime and water hardened by drying in the sun, like Mexican adobes; so that as soon as they were surrounded by the flood they began to crumble away, and so destroyed the refuges which the startled citizens would first seek.

The American Architect and Building News.

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CONTENTS.

A dozen gentlemen in Cambridge and Boston have issued a circular inviting adhesion to a society for the prosecution of archæological research. The annual contribution of the members is not to exceed twenty dollars, and no subscription is to be paid in until two hundred names are secured. With an assured income of four thousand dollars, the society would be able to explore any field of moderately easy access, and in time to make valuable contributions to the museums which it might endow. Most of the signers of the call are directly or indirectly connected with Harvard College, and this with the Peabody Museum of American Archæology, and the name of the curator of this museum at the bottom of the circular suggests the idea that the new society is to be mainly a coadjutor in his work, an idea which the names of the Professor of the History of Art at Cambridge and of the Honorary Director of the Museum of Fine Arts in Boston hardly suffice to correct. We understand, however, that such an inference would be unwarranted, and that although architecture is conspicuously without a representative among the promoters of the undertaking, the society is likely to give its first efforts, at least, to architectural antiquities. In this case it will appeal strongly to the sympathies and interests of our readers. Other civilized nations are signalizing their devotion to the humaner aspects of history at the early seats of our civilization, and Nineveh, Troy, Ephesus, Cyprus, Mycenæ, and Olympia are daily yielding new laurels to their discoverers. But Delphi, the most famous of all, remains unexplored, and while other towns less famous, and accordingly less likely to have been already disturbed, still line the shores of the Mediterranean, the chances of achieving other equally notable results are most inviting. To have a hand in them, and to share the laurels that may yet be won, is a luxury which may well be coveted by all who can afford the modest subscription the society asks for.

It is not known to every one how enormously the last ten years have added to our material for archæological study. The brilliancy of Dr. Schliemann's discoveries at Mycenæ and in the Troad have obscured the light of what would otherwise be considered investigations of surpassing interest, such as those which have been conducted at Ephesus and Jerusalem, in Rome and among the lake-dwellings of Switzerland, Italy, and Great Britain, and the discoveries in Yucatan and New Mexico on our own continent; and only the fascination of the awful mystery which surrounds the unknown world, into which we obtain a glimpse through the tomb of Agamemnon, could distract our attention from the hardly less wonderful fortune which has given us the Treasure of Hildesheim, the bronze works of Northern Italy, and, if recent reports are to be believed, has brought to light the veritable tomb of Romulus. To strictly archæological researches the society proposes to add labors in the interest of art. Perhaps the point where art and archæology are most nearly tangent is to be found in matters relating to the preservation of ancient works of art, and for this there is great need that some decided action should be taken before all past art is restored and improved out of existence. Ancient and mediæval art and architecture have perhaps no more faithful or learned devotees than can be found in America, and it may be that from the "nation of peasants," as the most imperious of modern critics calls us, will come that efficient protection for his cherished treasures which all his objurgations to his countrymen have not been able to procure.

The Massachusetts State Board of Health has prepared and sent out two circulars, one giving directions for disinfecting clothing, bedding, etc., so as to prevent the spread of contagious diseases, and the other containing some useful warnings against the dangers which attend the use of cesspools and privies, with suggestions for disinfecting and disposing of refuse. Such documents, widely scattered and carrying the authority of the State Board, cannot fail to be of incalculable benefit. The first paragraph alone, which in a few lines speaks of the evil effect of damp and tainted cellars upon the air of a dwelling, will call the attention of thousands of householders for the first time to their own neglected basements, where the specked apples and potatoes are left to complete their putrefaction, and a pool of water stands always in the corner, while mould and cobwebs cover the ceiling. Many a dark and noisome corner will be cleansed of its corruption, the sunlight and air will find their way where they never came before, and families, to whom it had never occurred that a cellar could be otherwise than damp and foul, will feel, in increased health and spirits, the wholesome influence of this simple reform. We are glad, too, to see the radical ground which the Board takes in its treatment of the question of house-drainage. It must be remembered that for sanitary reformers like Mr. Denton or Colonel Waring to advocate such a system as subsoil irrigation for disposing of house wastes is one thing, but for a State Board, accustomed to regard practical expediency as a primary consideration, to commit itself to this system, is quite another. The flush-tank and distributing pipes are as yet used so rarely and with such general distrust, that we are no less pleased than surprised to find the weighty authority of the Board given in favor of their general adoption. If the Board will supplement its recommendation by experimenting with the system it recommends in the public interest, so as to determine the conditions for putting it most cheaply and efficiently into practice, it will add much to the obligations under which it has already placed the citizens of the State which is so fortunate as to enjoy the benefit of its services.

We fancy that many of the persons who have at the same time some knowledge of engineering and of the power of an ocean wave have watched with interest the attempt now making to build an iron pier at Long Branch, N. J., but they can hardly have expected that the work would be brought to even a temporary stand-still thus early by such blunders as are pointed out by *Engineering News.* The pier was intended to be six hundred and fifty feet long and twenty feet wide, with a floor twelve feet above mean high water. This was to be supported on wrought-iron tubular piles, which at the shore end have a diameter of six inches, while they gradually increase to twelve inches in diameter at the sea end of the pier. Each pile was to be driven fifteen feet into the sand by the aid of a water-jet, and, that the sinking might be done rapidly, a pointed casting was soldered to the foot of each pile. These piles were to support longitudinal girders of peculiar construction, — the webs being made of two four-inch and one three-inch gas-pipes strapped and riveted together — which were to be braced laterally, and this appears to be the only lateral or transverse bracing which was to be attempted. On the twelfth day of April one hundred and fifty feet of the pier had been built, the diameters of the outermost row of piles being seven inches, and the engines had been moved out to the end, when a settlement of fifteen inches declared itself, which at once put a stop to further proceedings. As the piles are twenty feet apart one way and fifteen feet apart the other way, each of these outer piles might have to support the weight of a crowd which may at any time be collected on three hundred square feet of the floor, say a live load of eight or nine tons. This weight would be sustained simply upon the unenlarged lower rim of the pile, which according to the best authorities has an area of but 0.267 of a square foot; that is, under the conditions supposed, a pressure of from thirty to thirty-seven and a half tons per square foot would be brought to bear on a foundation of shifting sand, which during severe

storms is stirred up for a considerable proportion of the depth to which the pile is sunk. The board of directors who have charge of the work is nothing if not convivial, for this untoward accident was at once celebrated by a banquet, at which the president of the company is reported to have said that he was glad the accident had occurred, as "had it happened after the pier had been finished everybody would say the project was a failure." Apparently the directors have faith in the new devices which have been adopted for supporting their pier, but we believe that securing a firm bearing for the piles is not the only serious obstacle which must be overcome.

It is somewhat exasperating to contrast with such care and thought as has been bestowed upon the design and building of our own national monument the painstaking foresight which M. Viollet-le-Duc has concentrated on the preparation of the published programme which is to govern the competition for a statue of the Republic at Paris. As the competition is not open to foreigners it is not worth while to enumerate all its conditions. The primary competition, in which the merits of models of the statue and its pedestal, executed at one tenth full-size, are to be adjudged, closes October 6, 1879. As the statue is to be seven metres high, the scale adopted for this first competition is large enough to allow the sculptors to indicate with all necessary clearness what are their intentions. From these contestants three are to be selected by a jury of twelve men, — of whom five are to be elected by the competitors themselves, — who will be allowed six months to prepare new models — presumably mere modifications of their first designs. As the scale for this second competition is fixed at one third full size, the jury will be able to determine whether either of the three is worthy of being executed. In case the jury cannot agree on one design the contestants will receive prizes of one thousand, nine hundred, and eight hundred dollars respectively, and a new competition *ab ovo* will probably then be in order. In case one of the designs is approved, the second and third prizes only will be awarded, while five thousand dollars will be placed at the disposal of the successful sculptor, who will prepare a full-sized model of the statue preparatory to its being cast in bronze by the city. For the models of each of the accessory figures which may decorate the pedestal, he is to be allowed from eight to twelve hundred dollars, according to their sizes. The programme also recognizes the fact that the designing of a pedestal does not properly fall within the province of sculpture, and provides that the architect, who may be retained by the sculptor to design it, shall have full control of that portion of the work, and shall be paid at the same rate which is adopted for other new architectural works undertaken by the city.

After the lapse of three months *L'Art* has reviewed its treatment of Mr. Vedder which gave rise to the quarrel mentioned in our issue for February 8, but it is disappointing to find that it vouchsafes no more gracious explanation of what we pointed out was the real question at issue — whether or no *L'Art* obtained under false pretences permission to reproduce Mr. Vedder's pictures — than the statement that it does not for a moment admit that it is bound to praise a picture because the artist has consented to its publication, or that because it intends to criticise a work disparagingly it is debarred from the right of asking permission to reproduce it. To this we willingly agree, and we assent, too, to the argument that by publishing the subject of an adverse criticism an opportunity is afforded to the artist to make to the public a mute appeal from the judgment of the critic. But *L'Art* does not better its position by saying that Mr. Vedder, as the author of two paintings which were so inferior that they were not mentioned in any one of the published criticisms on the fine arts at the late exhibition, was not justified in thinking that they would receive any other than disapproving notice at its hands. This only shows how much more cruel was the disappointment of the too-believing American, who doubtless thought that at last an appreciative critic had been found. Such explanations as these will not, we fear, relieve the editors of the journal from the charge of a breach of good faith, for we cannot easily believe that they expected their invitation to be received as anything but a compliment. Of the justness of the original criticisms we hope to have before long an opportunity of judging, as we understand that an account of the quarrel, with reproductions of the offending paintings, is to be published in *Scribner's Monthly*. Intentionally or not *L'Art* has used at the end of its present discussion a tail-piece which, as the quarrel becomes more disagreeable with the lapse of time, well represents the two parties to the affair, — two archaic dogs, *sejant-combatant* as the heralds would have it, vomiting at each other large and ever-increasing missiles. The tail-piece, however, is perhaps less offensive than this peroration: "At any rate, we trust he will allow us to say that this is sheer ingratitude, for the remarks of our critic and the discussions they have occasioned have done more for the notoriety of Mr. Elihu Vedder than the Sibyl of Cumæ and the Young Marsyas."

THE OPEN FIRE-PLACE. XI.

Figs. 102, 103, and 104 represent the fire-grate recommended by the English Commission appointed for Improving the Sanitary Condition of Barracks and Hospitals. This apparatus, sometimes called the Galton Ventilating Fire-Place, though simple, combines the advantages of many of those just described, the heat-radiating ribs or flanges of Joly's fire-place, the splayed sides of Gauger and Rumford, the contracted throat, and at the same time furnishes us with an example of the use of a non-conducting, powerfully radiating material for fire-backs and immediate contact with the fuel. The grate is placed as far forward in the room as possible. The hearth is made of plate or cast-iron. The grates are of three sizes, according to the cubic contents of the room to be heated. A grate with a fire-opening of about 40 centimeters is for a room of about 150 cubic meters capacity; with an opening of 45 centimeters for 250 cubic meters; and with an opening of 55 centimeters for 350 cubic meters. Beyond this, two or more grates are required. Between the fire-clay lump and the iron back of this grate is a half-inch air space to admit a supply of heated air to the fuel, and secure a more perfect combustion of the smoke. This grate is easily cleaned or repaired, the front being secured by screws, which can be taken out when required, and thus render the interior and air chambers accessible. In this fire-place fresh air is heated only in the immediate neighborhood of the grate, but Captain Galton, in the appendix to his book on the Construction of Hospitals, recommends extending the available heating surface of the smoke-flue by carrying it through some fresh-air flue. This plan was adopted in the Herbert Hospital in the manner shown in the preceding Fig. 68, where the fire-place is in the centre of the ward, and the chimney consequently passes under the floor, as shown in section in the figure. The flue is placed in the centre of a square fresh-air flue (also shown in section), which supplies the air to be warmed by the fire-place. By this means a heating surface for the fresh air of about four square meters additional to that of the fire-place is obtained. The smoke-flue need not, of course, descend as in the Herbert Hospital. Instead of attempting to warm the fresh air before it has reached the ventilating fire-place, which involves a descending smoke flue, this air may be first passed behind the fire-place and then caused to circulate around the smoke-flue. The smoke then passes off without reversion. The manner in which it may be accomplished is shown in Fig. 105, and in this form of chimney we find the true principle of the ventilating fire-place. The radiant heat of the fire is increased by the fire-brick backing, while the heat of the smoke is utilized for a considerable distance up the flue, the fresh air being warmed in a chamber remote from the burning fuel. The fire-place stands well out from the wall. The fresh air enters behind and below the grate, and enters the room near the ceiling well warmed.

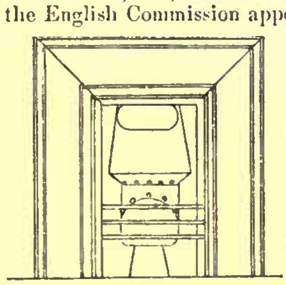


Fig. 102.

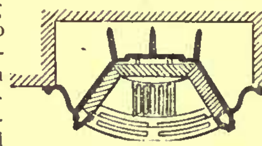


Fig. 103.

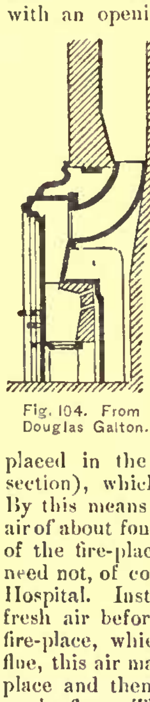


Fig. 104. From Douglas Galton.

Figs. 106 and 107 show the plan of this fire-place, the first designed with a grate to burn coal, and the second with andirons, and recessed deeper, to burn wood. This apparatus is simply a modification by General Morin of that described by Peclet in 1828 (Fig. 108), in which the fresh air passes through a tube, while the smoke surrounds it as it passes up the brick smoke-flue. This system is inferior to that of General Morin, inasmuch as a greater proportion of heat is lost by absorption in the surrounding brickwork. The ascent of the smoke, moreover, is

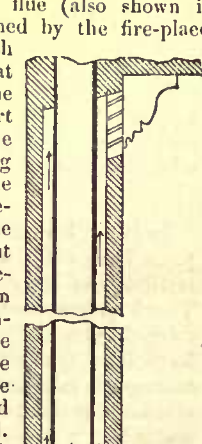


Fig. 105.

more difficult on account of the obstructions offered not only by the roughness of the brick-work, but by the presence of the fresh-air flue, whereas in Morin's chimney the round iron pipe furnishes a smooth passage of a form the most favorable possible for the ascent of smoke.

In 1832 Captain Belmas, in the Mémorial de l'Officier du Génie, speaks of a chimney similar in principle to that of Peclet. Finally Douglas Galton applied the same principle, very slightly modifying the form, in heating the English barracks.

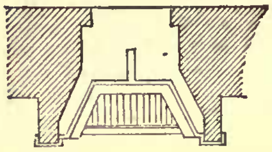


Fig. 106. From Bosc.

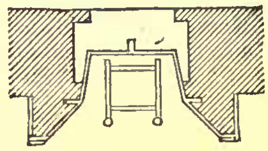


Fig. 107. From Bosc.

According to General Morin, these fire-places were designed to utilize more effectually than the common forms the heat given out by the fuel by introducing a considerable quantity of fresh air warmed to a moderate degree, to replace that which has passed up the chimney, and also to reduce the amount of cold air entering from the outside through the cracks of the doors and windows. "But while," he says, "the plans at first proposed drew in but a small quantity of fresh air, scarcely equal to one tenth of that passing out through the chimney, and raised it to temperatures of from 90° to 110° C. (about 200° to 250° F.), and often more, the forms devised by the ingenious Captain Douglas Galton for the fire-places of English barracks have furnished a very satisfactory solution of the problem, as has been proved by some experiments made with two fire-places of this kind at the Conservatory of Arts and Trades. Observations show that the amount of air admitted to the room at the ceiling through the fresh-air ducts at 26° C. (about 80° F.) differs but little from that passing off up the chimney, so that the admission of cold air through the doors is almost prevented. This introduction of warm air, in addition to the warmth produced by the ordinary radiation from the fire, increases its heating effect, which becomes as much as thirty-five per cent of the heat produced by the fuel, while the common forms of fire-place give but twelve or fourteen per cent, and those supplied with Fondet's apparatus but about twenty per cent."[1]

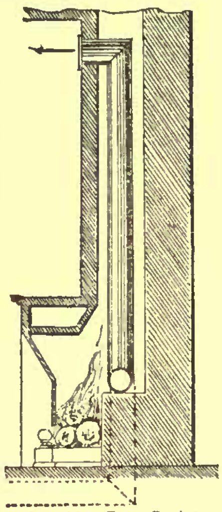


Fig. 108. From Peclet.

Nevertheless, the Galton fire-place is but little known, and seldom to be found in actual use. Bosc lays its failure to the difficulty of removing it when worn out, and to the unusual amount of space it requires in the chimney breast. "This kind of chimney flue," he says, "requires too much room, and cannot be used in our modern constructions where it becomes frequently necessary to carry up eight smoke-flues in a wall four meters long." The same objections are urged by Joly, who says. "It is always necessary to provide access to these double flues for the purpose of cleaning or repair, and if they are built in the walls, the space required for the twenty-five or thirty flues of an ordinary house would be enormous. On the other hand, what an effect these double envelopes would have in our apartments if concealed behind movable cases subject to expansion and contraction under the influence of the heat! The principle is good for barracks, but why not here simply leave the flues exposed to view?" It may be further objected that the actual saving of heat by the use of such an arrangement is still too limited, although, according to General Morin, it is even greater than with the apparatus of Fondet.

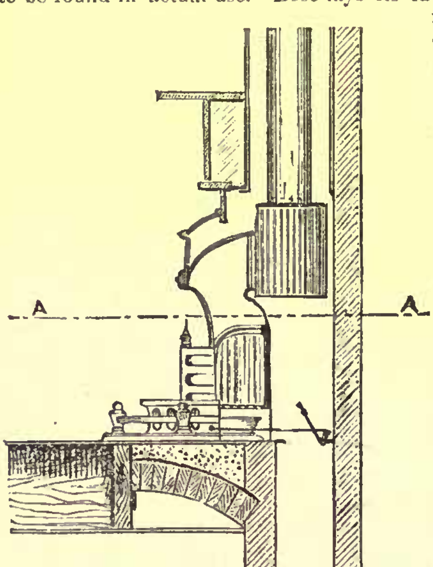


Fig. 109.

VENTILATING FIRE-PLACES MANUFACTURED IN THIS COUNTRY.

Figs. 109 and 110 represent in plan and section an excellent form of ventilating fire-place made in this country.

[1] *Annales du Conservatoire*, 6e volume, 1866.

It is similar in principle to the Joly fire-place, but is in some respects superior to the French example. The back of the grate is lined with fire-clay, by which the radiation is increased and the iron protected. Instead of the ribs or gills cast on the outer surface of the Joly grate for increasing the radiation of the iron in contact with the fresh air, we have here a jacket of corrugated sheet-iron fitting closely around the grate. This is an ingenious substitute for the fixed ribs, and has the advantage of economy and compactness, while it serves at once as a radiator and as a series of hot-air flues conducting the fresh air upwards, and retaining it in close contact with the iron back.

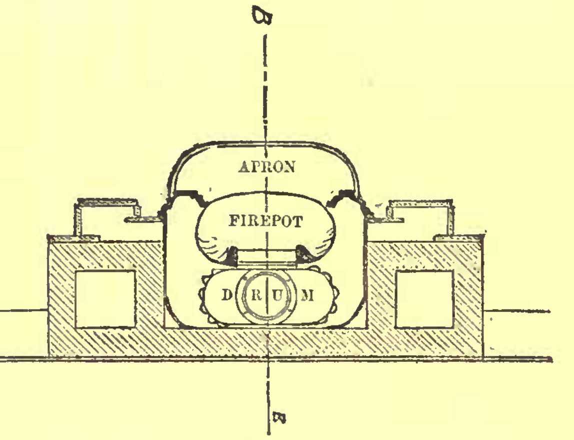


Fig. 110.

Above is a drum like that of Joly, but better located, inasmuch as it is farther from the flame, and is thrown back, so that while it allows the fresh air to impinge upon its lower surface as well as upon its sides, it throws the fire-place forward into the room where its radiation is more effective. The drum is also provided with a corrugated iron jacket. The air is admitted into the room either through a register placed in the projecting iron hood just over the grate and under the mantel-piece, and forming part of the portable fire-place, or it may pass up the fresh-air duct surrounding an iron smoke-flue, to the ceiling, where it may be admitted, as in the Galton fire-places, through a register near the cornice. It may be used therefore either with or without the double smoke-flue, and the warmed fresh air may be conducted into rooms above as well as into that containing the fire-place. Figs. 111 and 112 explain the manner in which this is done.

A novel and useful feature in this fire-place is the sliding blower or blowers of iron embellished with transparencies of mica slate, so constructed as to slide back into gas-tight pockets. These gas-tight pockets afford, it is claimed, additional security against the leakage of gas into the air heating chamber. The blowers, one above in front of the grate, and one below in front of the ash-pit, may be wholly or partially opened. When shut the apparatus is converted into a small furnace. If they could be rendered air-tight a fire might be safely kept alive in the grate all night as in a close stove.

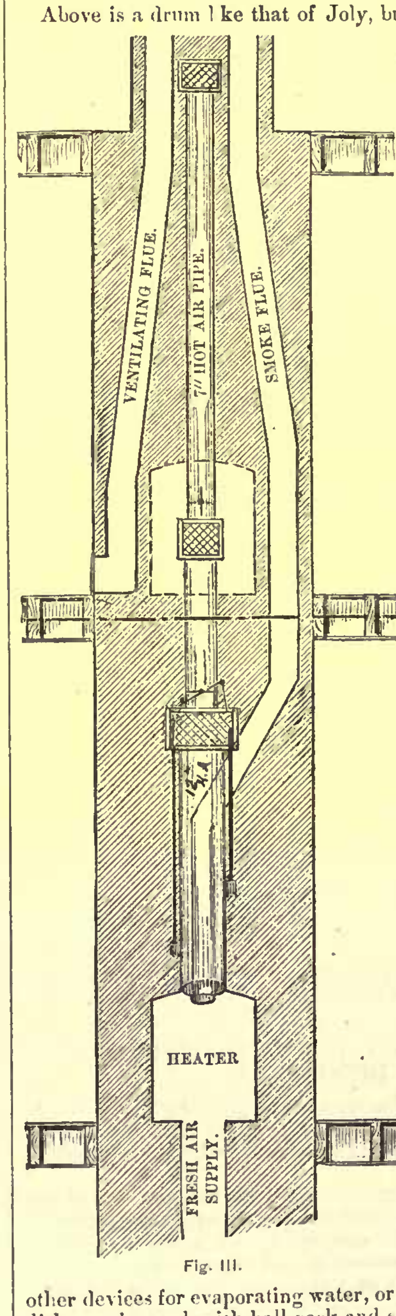


Fig. 111.

Ample space is left behind the fire-back for the introduction of earthen jars or other devices for evaporating water, or a regular furnace evaporating-dish may be used, with ball-cock and supply-pan outside. The cost of

this fire-place, which is called the "Fire-Place Heater," is advertised at from \$45 to \$50.[1]

Much of the success of these ventilating fire-places depends upon the intelligent setting and care in following out the directions given by the manufacturers. The fresh-air ducts should have an area equal to that of the smoke-flue, in order that all the air passing up the chimney may be drawn from that source, and not be compelled to enter through doors and window cracks. The writer has used this fire-place in one of his office rooms during the winter, and made the following practical tests as to its heating and ventilating powers. The room is the same in which the experiments on the old fire-place represented in Figs. 1 and 2 were made, and measured 6 by 6 by 3 meters (about 20 by 20 by 10 feet).

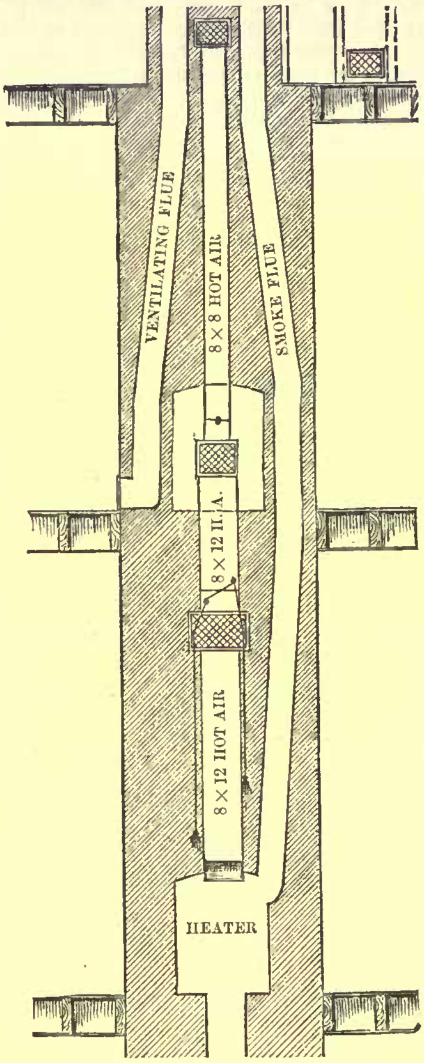


Fig. 112.

The old fire-place was removed and the ventilating fire-place put in its place. We have seen by our experiments with the ordinary fire-place originally used in the office that the combustion of three kilograms of wood served to raise the general temperature of the room but 1° C. Although the outside air stood as high as 13° C. above freezing, it was still 6° below that of the room when the experiment was begun, and as there was no furnace in the building, the air to supply the draught was obliged to come in unwarmed from the outside, and was sufficiently cold to combat successfully the heat of the fuel, of which we found only six per cent was utilized, the remainder, or ninety-four per cent, passing away up the chimney to be utterly lost.

THE ILLUSTRATIONS.

DESIGN FOR TRINITY CHURCH, ST. JOHN, N. B. MESSRS. POTTER & ROBERTSON, ARCHITECTS, NEW YORK.

THIS design for Trinity Church was presented in competition in the fall of 1877 and was accepted by the building committee of the parish. In the summer of 1878 the plans were discarded and a new competition instituted. It was proposed to erect the building of brown Nova Scotia-stone. The lowest reliable estimate for the church and school building complete was \$83,000.

THE CATHEDRAL OF COMO, ITALY.

This design is reproduced from the *Croquis* of the Intime Club.

GARDENER'S COTTAGE. MESSRS. WALKER & GOULD, ARCHITECTS, PROVIDENCE, R. I.

This cottage was built during the last year, on a gentleman's estate at Whitinsville, Mass.

FARM HOUSE FOR MR. J. T. MORSE, BEVERLY FARMS, MASS. MESSRS. CABOT & CHANDLER, ARCHITECTS, BOSTON.

THE AWARD IN THE SECOND COMPETITION IN INTERIOR DECORATION.

THE Committee of Award has decided to give the first prize to the design marked *Clay*, and the second prize to that one marked *Lynn*, while to the design marked *Persevere* is awarded an honorable mention.

In making the decision, the manner in which the demands of the programme have been complied with has first occupied the attention of the committee. Most of the competitors fail properly to recognize the condition as to the monumental and express character to be given to the piece. The design of *Clay* is conspicuous for the manner in which it has observed this prime requirement of the programme. Moreover, this design offers a better opportunity of displaying the dinner service, in that it centralizes the articles, and at the same time, by its shelves rising one above the other, allows each piece to be seen fairly, while the effect of the *ensemble* is not injured by the injudicious dispersion of the articles in separate niches or recesses. For these reasons, and in spite of the profuseness of the decoration and the errors in design which were pointed out in the last issue of this paper, the award has been made as stated. Between the merits of the designs by *Lynn* and by *Persevere* it was more difficult to determine, but it was finally decided that as the object of the sideboard was to display certain things, the second prize should be awarded to *Lynn*, whose two broad shelves offered a better opportunity for such display than the niches of *Perserere*, which would isolate the pieces one from another, while the central cupboard, though giving them a central place, rather conceals than displays them as the programme required. Moreover, the height of the lower shelf in *Lynn's* design, which has been attributed to an error in scale, may be accepted, perhaps, as adding to the monumental character of the design by removing the temptation to use the piece for the ordinary purposes of a sideboard. The committee has also been influenced by the fact that *Lynn* has made a more correct use of architectural members than *Persevere*, and has rendered them with a better knowledge of their significance, though his composition, especially as seen in perspective, is much less interesting.

CORRESPONDENCE.

BUILDING MATERIALS IN THE NORTHWEST.

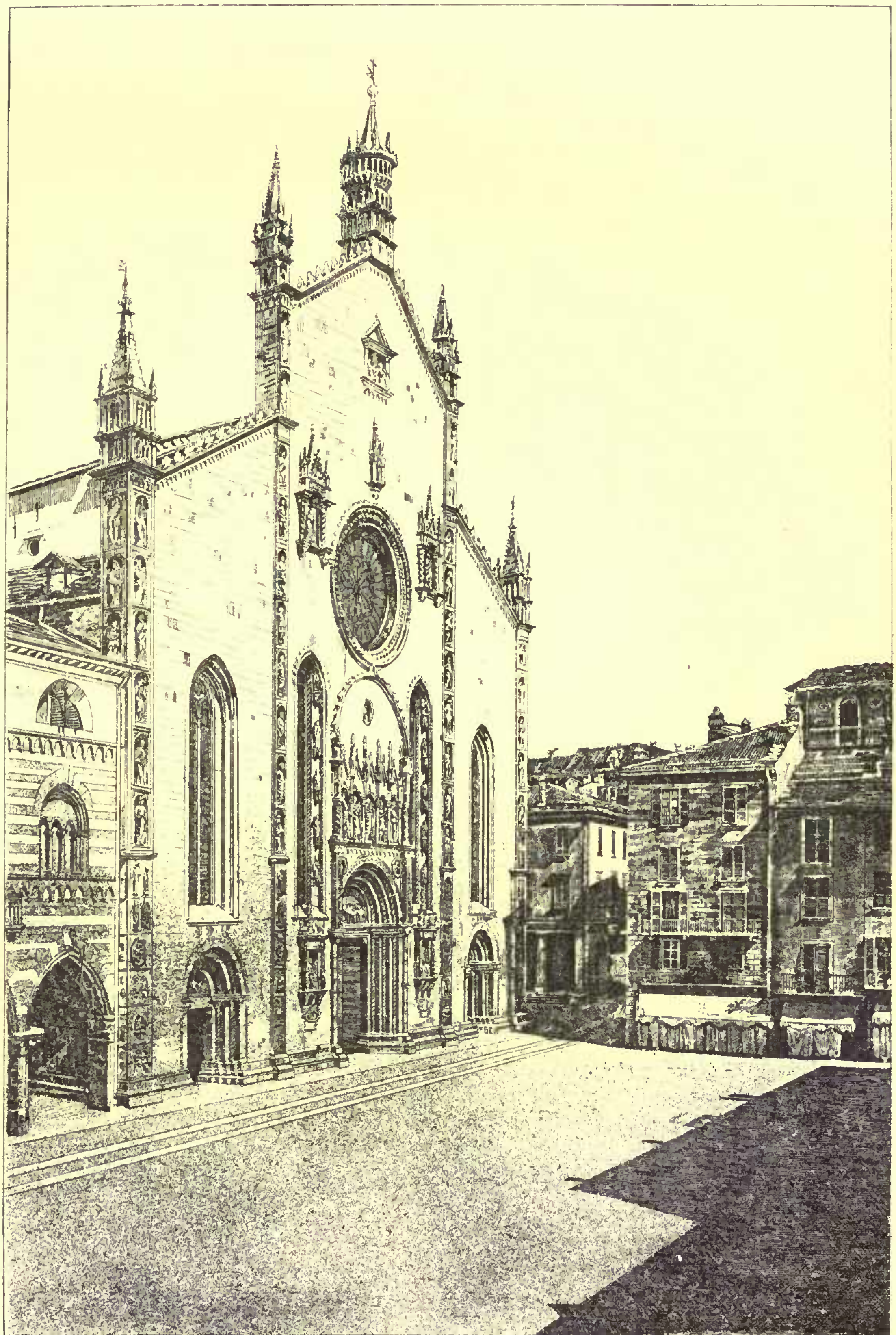
MINNEAPOLIS, MINN.

NOT quite a year has passed since the appearance in your columns of a communication from our corner of the land, making known to the remainder the doings of the building fraternity of this State. As the past year has been an active one, and, better still, has kept us refreshed with continued signs of progress, it may not be amiss to send another letter from Minneapolis, which has during the year expended much more money in buildings than any other place in the State, and as her architects and those of St. Paul are being yearly entrusted with a larger percentage of buildings in outlying towns, a report of things as seen at home will in a degree apply to the whole State.

Of materials, wood has ceased to be so prominent a factor as formerly, and its use seems also to be better understood. The architects of the older and more favored parts of the country rarely encounter a power with which even the most high-handed designer here is at times obliged to compromise. This is none other than a modest catalogue. Some years ago — this history is made up of about equal parts of rumor and surmise — some clearheaded designer and business man, seeing that the "finish" for the buildings of the great Northwest was furnished by factories, very properly called "mills," conceived the beneficent project of having clearly graven on wood the contours of some hundred or two mouldings, together with sufficient balusters, newels, pew-ends, brackets, etc., from which the most fastidious might choose such as suited his peculiar taste and circumstances. Plates without number were made from these, and every mill in many new and enterprising States was supplied with as many copies of the series as it chose to order and pay for. These were neatly bound in paper, informing the public of the proprietorship, location, name, etc., of the particular factory from which they were issued. This seductive pamphlet constitutes "The Universal Moulding Book," before which we cannot choose at times but to bow, and to the different permutations and combinations of the numbers within its covers, the bulk of the work of former times owes its grace. Cheerful justice demands the truthful statement that the "Universal" would appear to the closest student of architectural history to be the most original production ever encountered, for its forms cannot be made to appear to have any kinship to any production of the Old World in any age. But as "every dog has his day," so we are made happy at times when we enter the very fortress of The Universal Moulding Book, the "mill," and see occasionally the foreman getting up a design without its aid, very likely an adaptation of some architect's design which has been sent to the factory for execution.

The greatest outlay for buildings in town during the year has been in street fronts, and in these have the greatest improvements been made. Several were actually built without galvanized-iron cornices, — an act without precedent. Galvanized-iron window caps were never largely in vogue here. Some terra-cotta manufacturers in the State introduced a few years since some very ingenious contrivances for the office; they were elaborate Renaissance (?) productions, and were fastened to the face of the masonry by iron nails and cement. They have nearly all fallen off, but with a considerate discrimination against surgeons and undertakers. So the way was open to the stone-cutter, and last year gave us some very good (and some very poor) stonework. The largest street front built was from one of the Joliet, Ill., quarries, after designs by Chicago architects. It is of the slab construction to which this stone and one division of Western genius so readily lend themselves. The galvanized-iron cornice is in form and size probably more ponderous than anything hitherto attempted, and, were it not hollow, would — not stay there. As an offset the building has some fine carving by Mr. Legg, of Chicago. St. Louis red

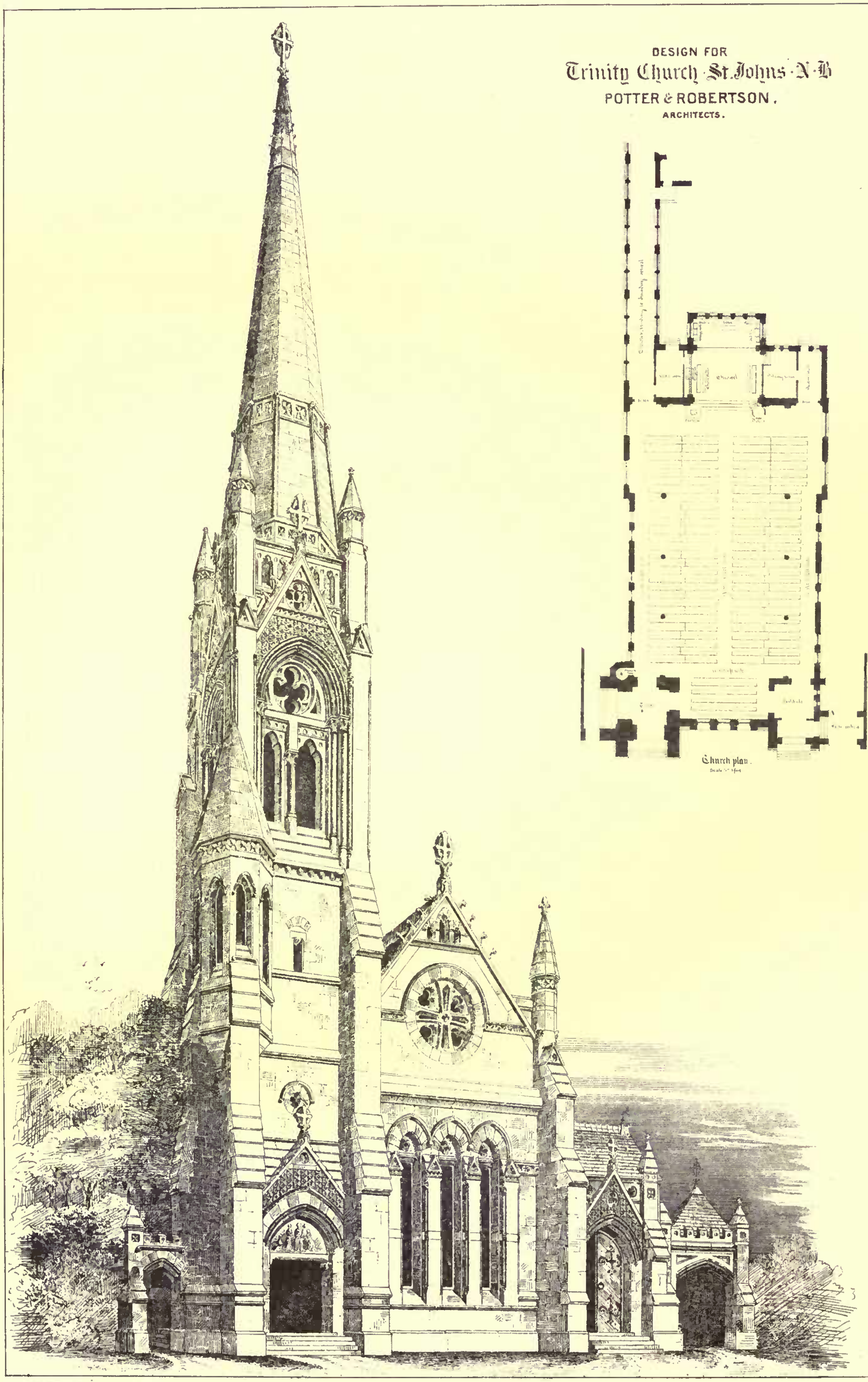
[1] Manufactured by the Open Stove Ventilating Company, New York.



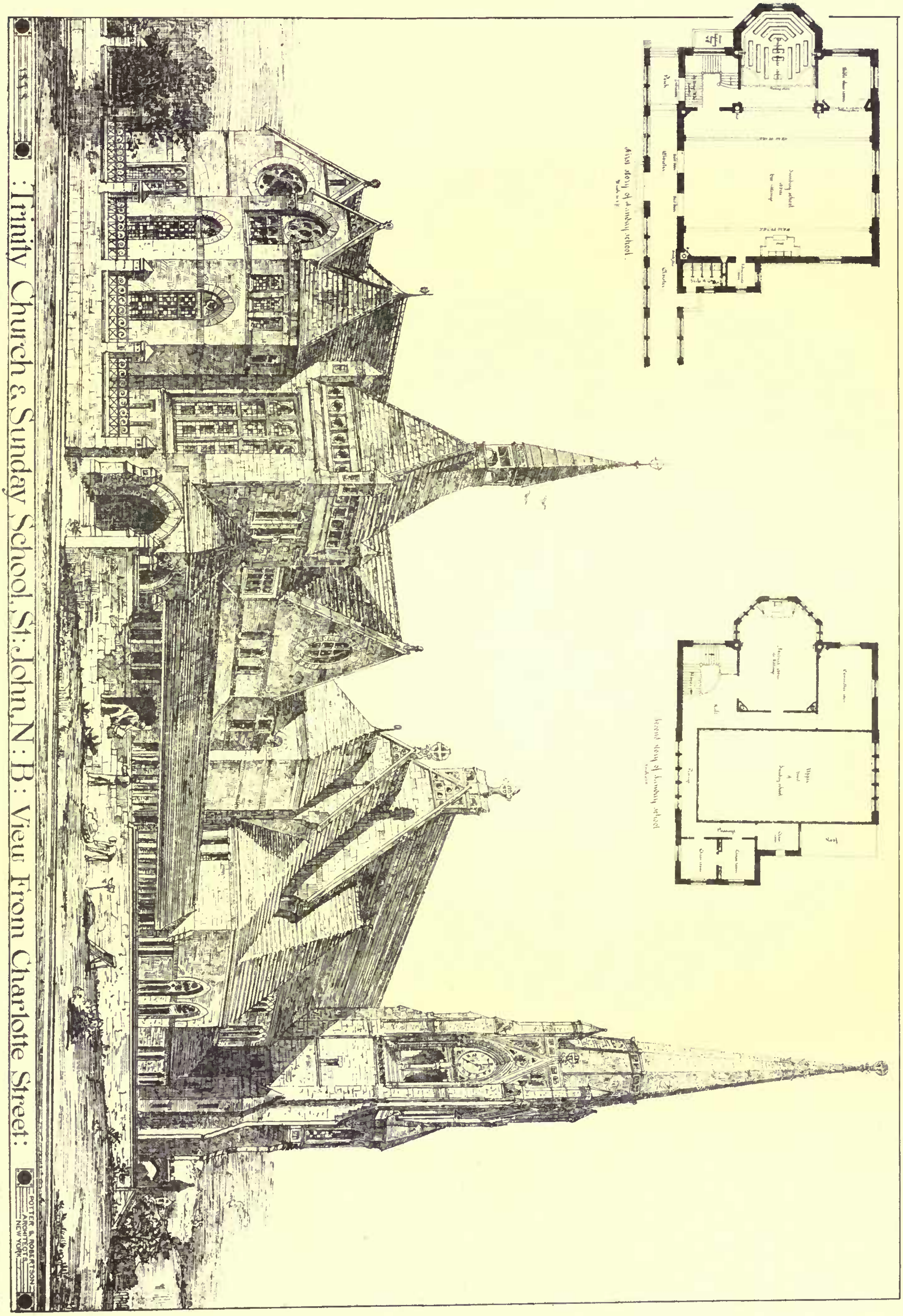
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Imp. Monrocq. Paris

FAÇADE OF THE CATHEDRAL OF COMO, ITALY.

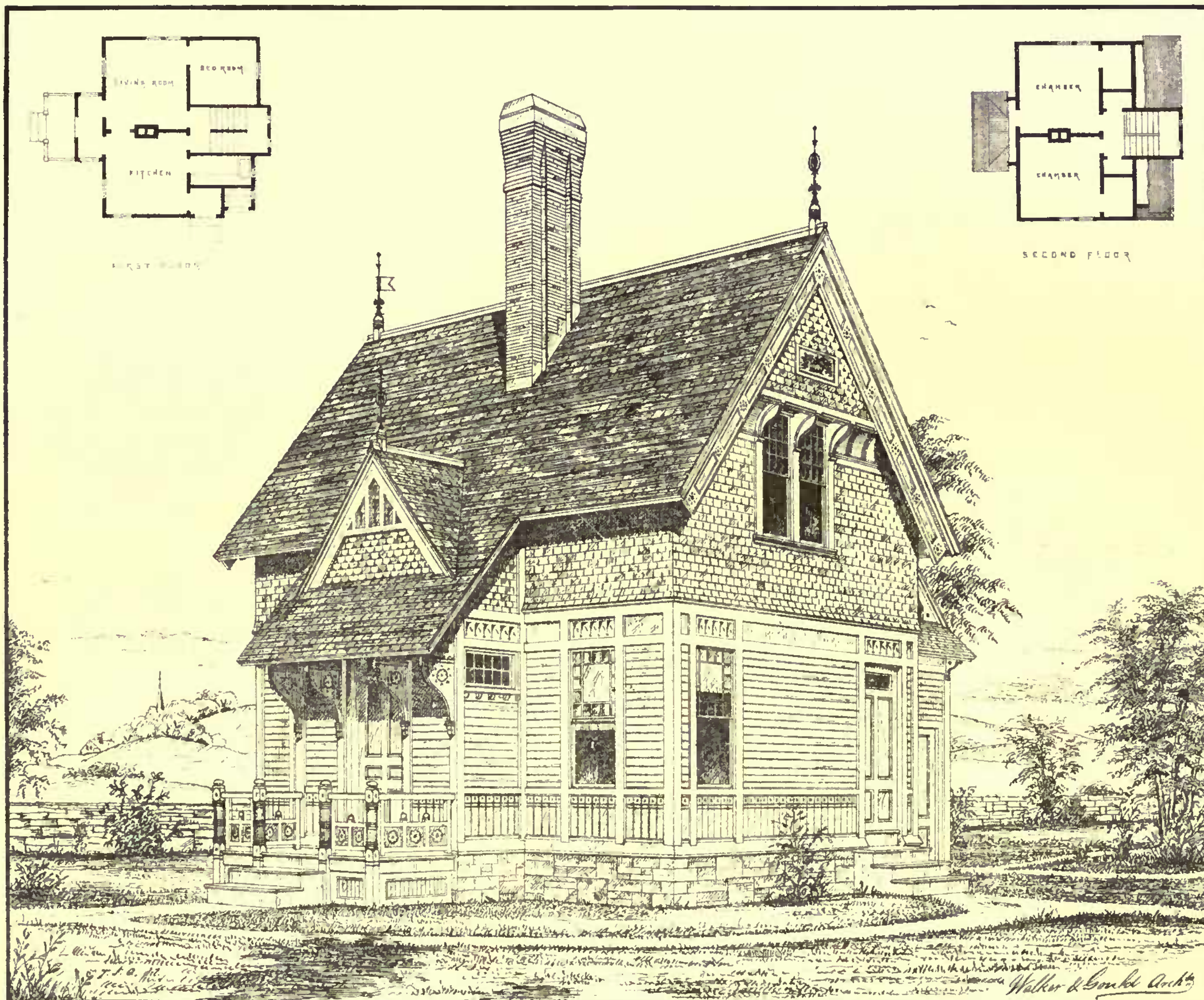


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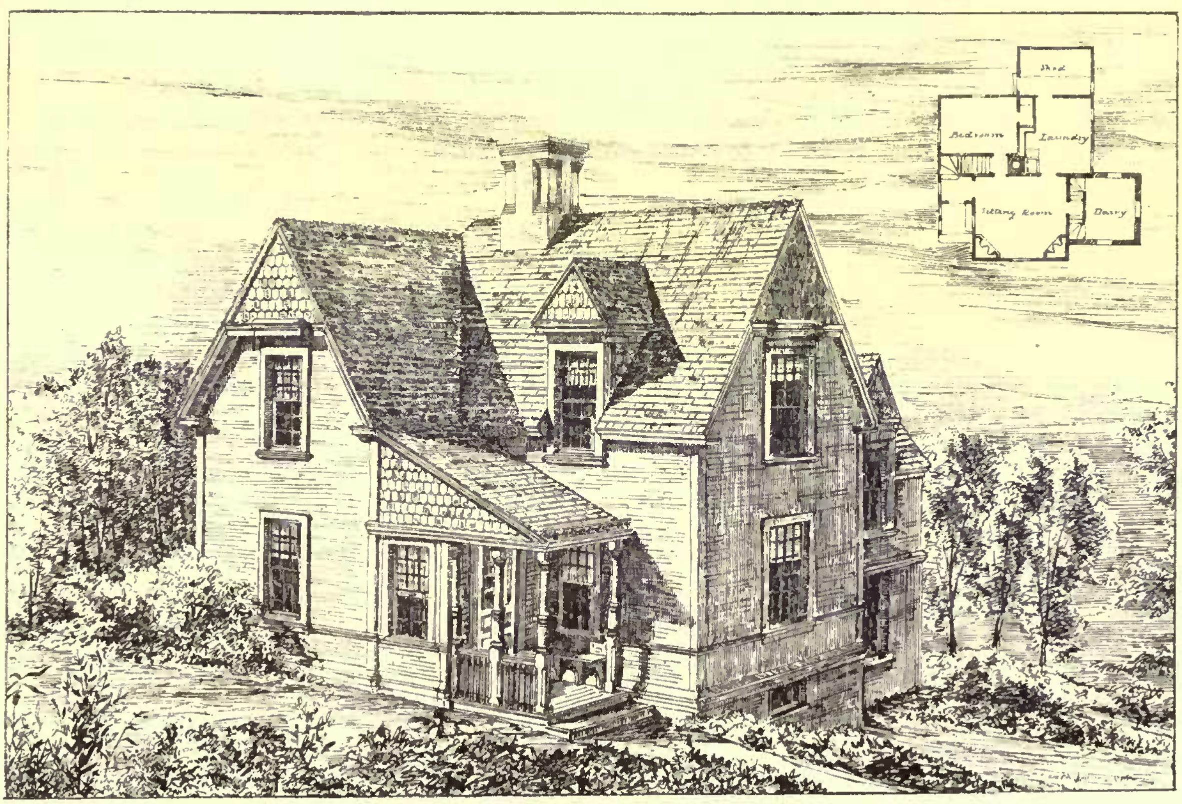


:Trinity Church & Sunday School, St. John, N: B: View From Charlotte Street:

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GARDENER'S COTTAGE



FARM HOUSE AT BEVERLY FARMS · FOR MR J. T. MORSE JR. CABOT & CHANDLER ARCHTS ·

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

pressed bricks were largely used in street fronts last season and will be still more in demand this year.

An old stone quarry that was worked some thirty years ago has been reopened and bids fair to be quite an acquisition to the building materials of the State. It is in a bluff near Lake Pepin, an enlargement of the Mississippi some sixty miles below us. The stone is a beautiful warm yellow, not unlike Caen-stone in appearance, but harder and with more color. It is very easily cut, and from the appearance of the quarry is durable. Tiling has been introduced to some extent in both exteriors and interiors. One source of supply for the latter is a fashion for decorating porcelain which has obtained among a limited number of the ladies of the place.

The most important enterprise of the year, architecturally, is the new Westminster Church, from designs by the architects of the stone front mentioned above. Contracts were made for the foundation last fall and bids are now being obtained for the superstructure. The building is Gothic in style — at least it has pointed arches. One very unique feature is a belt of galvanized iron, two feet wide, perfectly plain excepting for a small bead at the bottom. It is carried around the main tower in the stone-work some fifteen or twenty feet below the springing of the wooden spire, and whether introduced to prevent the stone-work from spreading or settling, or to induce buoyancy, or for purely æsthetic reasons, has not yet been announced from official sources.

But few large dwellings were built last season, but they were a marked improvement on those built before. In style most of the new work done by home architects has had a strong Gothic tendency, yet is more or less influenced by the "vernacular," and as may be surmised the "vernacular" is suffering by the secession of its best men. Not that it has not some stand-bys; here is an example of the ever loyal: an old practitioner who gave this advice to a student, "Young fellar, the first thing you want to learn out of books is to learn to let 'em alone."

One of last season's most prominent dwellings was about as near a literal copy of a house at Dedham, Mass., by Oakey & Jones, published in an early number of the Architectural Sketch Book, as local materials would admit of.

Interior decoration and furniture are faring very well in the hands of some of our ci izens engaged in the business.

Quite a stimulus was given to the love of good things by an "art loan" exhibition during the winter, which passed all anticipation in extent and merit. IIIIIIIIIII.

A NEW BUILDING IN WALL STREET. — THE UNION LEAGUE CLUB-HOUSE. — THE SUIT AGAINST THE SUPERINTENDENT OF BUILDINGS.

NEW YORK.

MR. GEORGE E. HARNEY has a very good thing which he is going to offer to "the street" during the coming season, and Wall Street will have added to its fine buildings another, which will bear comparison with any of them. Last year Messrs. Thorp & Clinton put up the Jauncey Court buildings for the Orient and the Queen Insurance Companies, and no small amount of criticism was called out by the odd companionship of these two dissimilar designs. The Harney building will stand on Nos. 14, 16, and 18 Wall Street, having a frontage of 69 feet, and a depth of 122 feet. An L, 24 feet wide, runs off 27 feet to Nassau Street. Far back in the early years of the last century, the site was occupied by a Presbyterian church, the first in the city, which is now represented by the congregation which has its house of worship at 11th Street and 5th Ave. The church was rebuilt once, and since its removal two sets of business houses have occupied the precious area. Now it is to suffer, or enjoy, another transformation and become a veritable temple of Mammon for the money-changers.

The property belongs to F. W. Stevens, Esq., who has had experience of Mr. Harney's professional ability in the buildings at the corner 57th Street and 5th Ave., and the corner Broadway and Bond Street. His selection therefore for the Wall Street building was a perfectly natural one. A building fund of $200,000, in these times of cheap labor and material, seemed to justify a somewhat ambitious design. There is Queen Anne enough about it to indicate that it was done in this season of the fever of that pseudo-style, but much moderation has been exercised, and the building is a natural one and excellently composed. The material is Baltimore brick and Belleville, N. J., brown-stone. Up to the water-table the material will be a light pink granite, but not much of this will show. The general design shows a heavy stone lower story in rubbed work, with broad square headed windows. There are two entrances opening on the curb level, each being flanked with stone columns supporting a broken pediment with the Dutch curls. The entrances are not placed symmetrically with relation to the rest of the front, one opening near the centre, and the other at the extreme right or eastern corner. The first leads only to apartments on the ground and principal floors, while the other is the general entrance to the building, and by a hall gives access to the stairways and double elevator fixed at the interior angle of the L. To this point a broad well reaches, and as it is to be lined throughout with white glazed brick, abundant light is looked for at every point of the interior of the building.

The front, above the stone lower story, has a central section about 20 feet wide with coupled windows in two stories. On the sides these two stories are spanned by large arches in brick, making in effect a great opening between the outer and the central pier. These openings heighten the appearance of the outside in a marked degree, while in the stone transom marking the floor line, and in the stone mullions between the actual window frames, opportunity has been given for carving. A strongly-marked belt-course runs across the building above the arches, and then come two stories with segment-headed windows, triple on the sides and double in the central section. The cornice is of stone, and above it the dormer windows projecting from the low Mansard roof are also of stone. The central dormer has been carried up into a prominent stepped gable with coping stones, making a bold finish to the front. The windows are filled in with leaded upper lights, but they will be in plate and not in colored glass. The construction throughout is to be fire-proof, with iron beams and hollow-brick arches, and the flat roof as well. The staircases will be iron, and halls and passages will be tiled and have marble wainscoting. The height will be 73 feet to the cornice, and to the curb line of the roof 91 feet, while to the top of the antique gable the height is 100 feet. The heating will be by indirect radiation, but fireplaces will be in every room. The plan of the upper stories is a very simple one, giving each office an exposure either to the street, or to the 18 by 45 feet well mentioned. As a business building of some pretension, and occupying a position of prominence, it will be interesting to see what effect its erection will have in guiding or modifying the rage for Queen Anne work.

As yet the fantastic does not seem to have found much favor with any class of architects or designers, but here and there are rising buildings in which the architect has made so evident and strenuous an effort to be in the style of his great-grandfathers, that one would think the highest art was to be reached by reproducing what was never more than picturesque, and then only in its surroundings, and for the society and people occupying the structures. Mr. Harney may fairly be said to have gone, in the Wall Street building, as near to a picturesque treatment as Queen Anne will bear for city use.

In the Union League Club competition, the committee on selection of design, having been given full power to select without further report to the club, has asked Messrs. Peabody & Stearns to present another study of the exterior after the suggestions of members. So that really the club-house design has not yet been selected, only the architects who are to prepare it.

The charges and case against the Superintendent of Buildings is falling through. The charges against the heads of Bureaus have been withdrawn, and those against the Superintendent are dragging on without seeming point or object. W.

THE RECIPROCAL DUTIES OF ARCHITECTS AND THEIR EMPLOYERS, ESPECIALLY IN RELATION TO PUBLIC BUILDINGS.[1]

Mr. President, and Gentlemen of the New York Municipal Society:

I have been asked to prepare and read a paper "on the duty of architects as to economy and appropriateness in their designs, especially for public edifices, and as to the responsibility (in whom generally?) for the cost so generally being immeasurably beyond the estimates." In my answer, acknowledging the honor done me by the request, I said that if I complied with it, "I should have to join in the theme the reciprocal duties of owners and building committees."

Let me say, in the first place, on the point of economy, that, so far as my information goes, it is only in a very few cases of public buildings that the cost is largely beyond the estimates. It is with buildings as it is with people. The individual is lost in the crowd unless preëminent either for good or for bad. The million inhabitants of New York go about their daily business with little comment. But let one of that million, of any grade, commit a murder, or one of them, of prominent grade, be detected in any flagrant breach of a conventional law, and for nine days, more or less, the newspapers feed all the rest of that million with the scandal. Just so with the buildings of the community. The larger or smaller capitalists build their blocks of houses in the city, or their single houses in the country, and no one, except those interested as disbursers, or recipients or prospective occupants, hears anything about them. They are built sometimes with, but oftener without, the intervention of an architect. When one is employed, I think it is very seldom that the charge of going beyond the estimates, except under the owner's orders, can, after investigation, fairly be brought against him. Few people in this community build more than one or two houses for their own occupancy during a lifetime; but while this one is building it is the owner's hobby. Nothing is too good to incorporate into it. Self-importance and sentiment — all the feelings of the *pater familias*, the desire for the maximum of domestic comfort and of opportunity for the display of resources, — all are actively at work from the first line drawn on paper to the setting of the capstone; and I think it is, perhaps, more common for the architect to incur the displeasure of the owner, tacit or expressed, for attempting to control his inclination to lavishness, than for endeavoring to lead his employer into avoidable expense. When the day of reckoning comes the owner may find it a relief to his feelings to lay the blame for over-

[1] Read before the New York Municipal Society, by A. J. Bloor, F. A. I. A., on December 3, 1877, and presented November 14, 1878, to the Twelfth Convention of the American Institute of Architects, by whom it was referred to the Committee on Publications.

expenditure on another's shoulders. The payment of extra bills is not conducive to amiability or candor. And I think it is just at this stage that an owner is apt to wax eloquent over what he chooses to call the extravagance of architects. I doubt if, in one case out of ten, an owner will, after the settlement of bills is quite off his mind, have one word to say in relation to the cost being beyond the estimates, except so far as, by additions and changes, he has himself gone voluntarily beyond the original estimate.

Public buildings of course attract greater attention than private ones; and the facilities for increasing expenditure, whether lawfully or unlawfully, are also greatly in excess. Many reasons conspire to this. For one thing, there is often long delay between the tendering of estimates and the commencement of the work, and the market price of material and labor — for they generally fluctuate together — may have greatly increased in the interim. The work will then progress on an enhanced scale of prices, which is not nearly so apt to be sedulously kept before the eyes of the tax-paying community as the first low estimates were. Hence a great newspaper hubbub, when, on being called to foot the bills, the tax-payers discover the difference between their amounts and the original estimates. Again: In the case of a private building the architect has but one employer. In the case of public buildings of importance he is quite likely to have a dozen. Each man on the building committee has his own pet theory, and often his own personal interests, more or less direct, to advance; his local interests, his social interests, his family interests, perhaps his direct pecuniary interests; the last, it may be, in a perfectly lawful way from a commercial, if not from a public-spirited point of view, and perhaps not, as investigation sometimes proves. And I may be allowed to remark here that I know of no instance where legal investigation has resulted in fastening a charge of corruption on the architects of any of our public buildings. Whatever may be thought of the design or lack of design of the new County Court House in this city it has yet to be proved — and there has been much litigation and airing of facts in the matter — that in the case of that greatest scandal in the way of building operations in this or probably any other country — the architect was at all responsible for its cost being so immensely out of proportion to any fair estimate of its value as a pile of building materials. Tweed's recent testimony — whatever that may be worth — includes building contractors on that structure in its damaging statements, but not — so far as I have observed — the architect. The recent investigation into the affairs of the new Capitol at Albany casts suspicion on Commissioners and Senators and Superintendents, but not on any architect. I speak only of legal culpability, and will not exceed my limits by entering on the question of how far an architect deserves to be criticised who draws a commission on costs he cannot help knowing are immensely above fair market rates; or who, without allowing the question of fitness in selection to interfere, makes secret arrangements by which stone from a quarry, or iron from a foundry, in which he has an interest, is used; or who adds to greed a morbid egotism that blinds his eyes to the merits of any work but his own, and leads him to foist his cuckoo eggs in another's nest, at no matter what cost to artistic congruity or to the public credit, or who leads, or endeavors to lead, his employers, who may be simply the trustees of other people's contributions, a dance of disbursement, at their cost and his profit from one insufficient building for public uses to another, of equally fine promise and equally disappointing result, probably. The charges of dishonesty against the architects of the Jefferson Market Court House were not sustained after legal investigation. All that was proved was that a competent subordinate in the architect's office had permission to receive, on his own account, a moderate compensation for furnishing bills of quantities to the mechanics, — a most useful and valuable practice, which prevails in Europe in building operations, and, as many experts think, is much needed in this country.

It has been asked whether architects have not a moral responsibility on the side of the public, as apart from their own personal emoluments and professional ambition, when they have any real share (which, however, I think the manipulations of the financial and political managers of public buildings seldom leave to them) in shaping the expenditure of public money. I think they *are* morally bound to use whatever influence they can command to dissuade building committees from wasting the money collected for purposes of public beneficence from the tax-payers, on showy façades to asylums and prisons, at the expense of interior space and convenience, sanitary or other; and consequently at the expense of the health and comfort of the poor and unfortunate in their community, whose wants might be cared for with the money thus used. But if reform is really wanted in this matter, there is more need to attack the rivalry and ostentation of commissioners and building committees than their architects. The latter are in fact only the hired servants of the former, and the mass of them closely resemble men of all other professions and vocations in preferring for themselves and their dependents bread, and as much butter as they can scrape on it, to creating enmity among their employers by attempting to lecture or reform them. It does not take a man of much observation or insight, architect or other, to find out that swift and early reward in a worldly sense (no matter what success a higher course may command to those who remember the Italian proverb that "everything comes to those who know how to wait") will be, not according to his faithfulness to what is right, but according to his pliancy to egotism and greed, and the effrontery and impudence, the trickery and falsehood, which are born of them. For faithfulness is a virtue which, though he may be glad to employ it, in the person of others, for his own interests, is at heart greatly despised by the average *soi-disant* self-made man (though he is generally — yet with many admirable exceptions — not more than quarter made in reality), whose success has been mainly achieved by, it is true, the virtues of energy, enterprise, economy, and foresight, but also too often by persistent domineering selfishness and the deliberate repression of the finer instincts; and who of course carries his vices as well as his virtues into his relations with the current forces of the society he dominates. The architect of an important public building has generally enough to do without turning reformer and philanthropist, in protecting the interests of himself and those dependent on him from the rapacity or ignorance, or both combined, of those who are masters of the situation. For there is quite likely to be a ring behind himself and the honest men on the building commission, a ring which is, in popular phrase, "on the make;" and he will be very apt to lose pay for his own work and reimbursements for his employees' work already performed and in prospective, if he in any way interferes in its machinations. Indeed, like the rest of the community he may have no knowledge of them that would have any standing in a court of law, no matter what his moral certainty, or his suspicions, may be, till some internal quarrel results in public exposure.

And even if no ring for ulterior purposes exists, the various members of a building committee, though they may be ever so honest and well meaning; though they may be shining lights of the church, the forum, or the exchange; though they may be travelled men of large general culture, — even of scientific and artistic culture, — hardly ever have any available knowledge, for practical purposes, of the theory or technics of the building art. The unhappy thing, both for themselves and for the architects, is that they conceive, if they have skimmed over the three or the five "orders," — whichever number suits them the better, — and have paid their mechanics for putting up a stereotype house of their own, or have simply read the weekly quotations of the prices of brick and lumber, that they thereby become adepts on every point that exercises the powers of the architect in his complicated and difficult field. Of course the ideas of such persons as to what is due the architect are apt to be very hazy. Amateurs for the nonce are very apt to see no difference, not only in resultant value, but in cost of production, between the tokens of their own irresponsible surface work, and those of the practitioner's years of general, and weeks or months of special, study and application. After a little observation of the routine of an architect's office the more sensible of them soon learn to place a juster estimate on the value of his skill and the cost of rendering it on paper for the use of the employer and mechanic. But there are some men who seem never to get quite over a misty feeling that an architect is a sort of cross between a mason and a sketcher, and that his time and labor are not gaugeable for practical and remunerative purposes as other men's are. Yet the fact is, so far as instinct and capability go, that except in the exercise over their drawing boards of more or less of the creative faculty, — a faculty not greatly exercised by the multitude, — architects are remarkably like other men, while in their current necessities they are absolutely like them, from him who eats the best of bread and the sweetest of butter by plying his trade of king-craft, down to the *chiffonnier* who scrapes his crust out of the ash barrel. Like most well-reared people, they are much addicted to eating and drinking. As a rule architects don't smoke poor tobacco if they can get good cigars. They live in, as well as build, houses. They wear clothes, and their tailors are not called on to leave orifices for wings as well as as for limbs. Their pinions are not so well developed but they can brace them down with their ordinary sartorial appliances. Being taught that there is neither marrying nor giving in marriage in heaven, most of them — not being Newtons, or Pascals, or Turners — consider it their duty to society to get married here, and ever afterward take a vivid interest in the market rates for children's shoes and school bills.

There is really no reason why architects, as a body, should be cut off from the practical sympathies of the rest of mankind on the score of genius so exceptional as to be able to dispense with the advantages of association with safe and easy-going mediocrity. Carlyle states as an enthnological fact that Great Britain is peopled with forty millions of inhabitants, — mostly fools; and it is well known that the amiable sage of Chelsea has, at least, no better opinion of their forty millions of cis-Atlantic cousins. No doubt he classes the architects with the rest of the inhabitants, while Ruskin's latest dictum — and it may be accepted as his latest, at least, till the next number of *Fors-Clavigera* appears — about the profession is that it comprises the most sordid and stupid of mankind. Yet the average architect is as apt to see the entire length of his nose as other average men. When hard pressed by his needs or his ambition, he is as apt to know how to use suppression, detraction, or equivocation, when he does not employ something still more positive, in the case of a real or assumed rival, or of one who cannot be used as a tool, quite as well as the next average man, and he has been known to evince his adaptability for all the uses of average citizenship by allowing the wool to be well pulled over his eyes, and by following the track of the best-fed leaders in a way that would honor the agile allurements of the most unctuous bell-wether of a Tammany Convention.

MILWAUKEE HEALTH REPORTS.[1]

THIS is a very comprehensive and satisfactory report. It is not presented as an original contribution to sanitary science, but as presenting to the government and people of Milwaukee "information in regard to the means of preserving the public health." It is to a certain extent elementary, as all such documents must be if they are to be of wide, instructive influence. It is very largely a compilation, but it is a very judicious compilation, and the thread on which Dr. Wight has strung his well selected beads often helps very much to present them in their most effective light. For example, referring to the conflict between the two opposing schools, of which one maintains that diseases are transmitted by living germs, and the other that they are produced by chemical products of organic decomposition, he says, "but practically it makes no difference which theory is correct. Mankind are just as anxious to escape being poisoned by a living thing as by a dead thing. It is just as hard to see a friend die with splenic fever, the cause of which is demonstrably known, as with enteric fever, the cause of which is unknown. Fortunately the sanitarian is not obliged to wait for a solution of the great and interesting problem; he has to use the same means of preventing disease whether disease is caused by living germs or dead ferments. We had better make haste to find out whether we are drawing from our costly hydrants particles of our own excreta, which are liable at any time to be impregnated with the germs or the virus of epidemic disease. It is important to consider whether individual citizens have a right to run through the sewers into a river, thence to find its way to our drinking-water, whole cords of accumulated night-soil from the vaults of old privies, where it has become putrescent with long decay, which may contain myriad spores of disease, and which certainly is a mass of organic matter freighted with dangers to human life."

The range of subjects of general interest covers: Sewers, sewage, and sewer-gas; water supply; the health of schools; meat supply; a number of specific diseases; adulterations of food and drink, etc. The whole forms a really valuable text-book for the sanitary student.

RHYMES OF SCIENCE.[2]

ONE of the most curious instances of book-making, for it is nothing more, is the little collection of rhymes and jingling verses, a score or more in number, which has been issued lately by a publishing house in New York which, judging from its catalogue, has hitherto contented itself with publishing small manuals on various industrial and technical subjects, — but the chance of being at once humorous, poetical, and instructive has been too much of a tempation to be resisted, and this little compilation of some of the witty writings of the Rev. Richard Barham (Thomas Ingoldsby), Bret Harte, J. G. Saxe, and others, is the result. Fortunately it is so short that it can be read in twenty minutes, and so does not afflict the reader with that feeling of depression which usually follows an attempt to read many pages in any of the more pretentious collections of wit and jest. The best thing in the book is The Song of the Screw, which appeared anonymously in *Nature*. The following verse from the Three-Foot Rule, by Professor W. S. M. Rankin, — the only rhyme which at all touches the technics of building construction, — will serve to show the character of the work: —

> "Some talk of millimetres, and some of kilogrammes,
> And some of decilitres to measure beer and drams;
> But I'm a British workman, too old to go to school —
> So by pounds I'll eat, and by quarts I'll drink,
> And I'll work by my three-foot rule."

THE ROOF OF THE GRAND CENTRAL DEPOT IN NEW YORK.

NEW YORK, April 28, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — Nothwithstanding the assertion of your correspondent H., in your issue for the 19th inst., I happen to know that the late Mr. R. G. Hatfield did design the roof of the Grand Central Depot in this city, as it now stands. The design proposed by Mr. Duclos was that of the segment of an arch resting upon side walls, at a considerable elevation from the ground; and there was also one by a German engineer, which contemplated the employment of intermediate columns. These plans were submitted to my brother and were not approved by him. He recommended a complete semicircular arch, springing from the ground, and gave a sketch of it, — and this was adopted by Mr. Buckhout, the chief engineer of the Harlem road, and by Mr. William H. Vanderbilt, the vice-president. Thereupon my brother made the computations of all the strains, designated the arrangement of the ties and struts within the rib of the truss, and gave the sizes of the iron; this was immediately ordered by the Architectural Iron Works of this city, who had the contract for its erection. Mr. Duclos, who had the general supervision of construction and drawings in that establishment, had the necessary working drawings prepared to carry out the plan; and this he did in a very admirable manner, it is true, but certainly entirely in accordance with my brother's adopted design.

The span of the roof is nearly 200 feet, and the clear height at the centre is about 90 feet. The trusses are tied at bottom by a rod under the surface of the ground, inclosed in a pipe under the tracks of the railroad — a feature which the segmental arch did not admit of, but which, however, could have been dispensed with, had opportunity been afforded to construct the necessary foundations for abutments.

I do not depend upon recollection alone for the above facts; I have in my possession the documents, including a business diary, to substantiate them. Very respectfully yours, etc.,

O. P. HATFIELD, *Architect.*

[1] *First Annual Report of the Commissioner of Health of Milwaukee* (O. W. WIGHT, M. D.). Twelfth Annual Report of the Department, January, 1879. Published by the city authorities.

[2] *Rhymes of Science. Wise and Otherwise.* With Illustrations. New York: Industrial Publication Co. 1879.

BUILDING IN DENVER, COL.

DENVER, COL., April 21, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Your correspondent in our city must be a new-comer, for his statement of the situation is very wide of the true state of the case. Usually our earnest building operations commence in July or August, and continue from that time until mid-winter, when we slack up in a measure until mid-summer.

This year we have commenced early in consequence of the rush of immigration and the accumulation of three to four millions of dollars of money from mines worked last fall and winter — a very large part of which has centred in this city.

Last year we used thirteen million brick in this city and suburbs. This year I estimate twenty millions as the amount we shall use. We are just at this time commencing heavy buildings. There are now under contract and about ready for proposals business buildings that will surely be erected sufficient to consume six millions of my estimate.

The architectural profession is represented by five regular practitioners, — and seven or eight who connect building with their office work. Still I am not aware of much sharp competition except among the new-comers and those who contract for the work in connection with the profession. Yours truly, H.

NOTES OF EXPERIENCE AND INEXPERIENCE.

6. CENTROLINEAD. — Some one asked lately in these columns for information about centrolineads and other devices to be used in perspective drawing when the vanishing point is off the drawing board. The simplest and worst thing of the kind is a straight-edge with two rollers inserted, like those of a parallel ruler, but of unequal sizes. In using, the end with the largest wheel advances fastest, so that the whole rule sweeps around in the arc of a circle, of which the edge of the rule forms part of the radius. By shifting the rollers, putting in larger or smaller as required, the arc can be so modified that the straight-edge will always point to a given centre, which coincides with the desired vanishing point. A better form of centrolinead consists of a three-armed rule, of which all the arms are movable, but can be fixed by a clamp at their intersection. Two studs being fixed at equal distances above and below the vanishing line, the long arm is made to coincide with the vanishing line, and the angle between the two short arms, one of which rests against each stud, is modified until the prolongations of the direction of the straight-edge in different positions intersect at the vanishing point required. The smaller the angle made by the two short arms, the nearer will be the vanishing point. If the short arms form two right angles with each other, or 180°, the vanishing point will be infinitely distant. If they form an angle of 0°, or coincide, the stud will be the vanishing point. With these two instruments the perspective must first be laid out at a small scale, and the edges fitted to the angles so found. A much better arrangement consists of a set of curves, cut out of sheet-brass about one twentieth of an inch thick, each being about twenty inches long, with a hole in each end for fixing to the board with thumb-tacks. Each curve is crescent shaped, the convex side having one radius, and the concave side another. The radii differ by one inch, so that with a set of ten curves the radii will run from twelve to thirty-one inches. For use with the curves, a common T-square has two pins inserted in the back of the cross piece, equidistant from the edge which the pencil works against when the T-square is on its back. One of the curves, say of thirty inches radius, being pinned near the edge of the board, by turning the T-square over, and setting it so that the pins will run along the edge of the brass curve, one edge of the blade will point always to the centre of the arc, an imaginary point thirty inches beyond the edge of the board. In use, a curve should be selected for one vanishing point, and the other, which will generally come on the board, should be calculated accurately, as it is of great importance in perspective drawing, to have the vanishing points correct to at least one eighth of an inch. By turning the T-square on its face, it serves for the vertical lines without loss of time in changing it for a different instrument. This apparatus, consisting of a T-square and ten curves, used to be sold for about ten dollars. Economical draughtsmen could get the brass curves cut for them, and acquire an equally good outfit for about five dollars. Now, according to a circular lately sent me, Mr. J. B. Shengle, of Tiffin, Ohio, sends a set for $2.50, which is cheaper than any one could get them, properly made, in small quantities, and they are well worth the money.

AN OLD DRAUGHTSMAN.

18. SLACKING LIME IN CELLAR. — No evil consequences are to be feared from the slacking of plastering lime in the cellar of a new house further than those which may be caused by the dampness from the steam swelling the finish or hard-wood floors in the rooms above. Where plastering is done in a finished house, it is worth remembering that butternut is deeply stained by the contact of lime, and, in a less degree, hard-pine, so that these woods should be carefully protected against falling mortar. C.

19. PAINT MINE. — We often see mention made in Western papers of the discovery of a valuable paint mine. Will some one have the kindness to tell me in what form the paint is found; whether, if it is used at all, it is used with or without oil, what its color or colors are, and how it is affected by dampness, sunlight, and the various atmospheric changes?

WHITE LEAD.

NOTES AND CLIPPINGS.

ACCIDENT AT MINNEAPOLIS.—One might think that when the walls of a building which had been destroyed by fire were thought to be so unsafe that an attempt was made to blow them up with dynamite, the attempt would not be abandoned, and the shaken walls used for a new building. Yet this was done in Minneapolis with the Galaxy Mill, one of the flour mills which was destroyed by the explosion last May. Various architects and builders declared that the walls, which were unsafe before, were perfectly safe in spite of the shaking given by the dynamite, and some twenty-five workmen were at work rebuilding the mill the other day, when one of the walls, into which they were fitting the ends of the girders, fell and killed one of the masons.

PNEUMATIC DISPATCH IN NEW YORK.—The Union Telegraph Company of New York have experimented for the last four years with a view to establishing a pneumatic dispatch service in that city, and have several short routes already in working order. The tubes, which are of brass, drawn solid so that their insides are perfectly smooth, are arranged in couples and buried in durable wooden boxes below the surface of the street. The messages or packets are placed in leathern pouches which accurately fit the tube, which has a bore of two and one quarter inches, and are driven through the tubes by compressed air, the reverse passage being effected by exhausting the air, the same engine performing both operations. The time occupied by a message in passing from the main office at the corner of Broadway and Dey Street to the Stock Exchange on Broad Street—they are about a quarter of a mile apart—is twenty-five seconds.

CARNIELO'S STATUE OF THE DYING MOZART.—Mr. James Jackson Jarves writes to the New York *Times* as follows of one of the Italian statues exhibited at the Paris Exhibition, of which we lately published a somewhat favorable criticism by the noted critic, M. Louis Ménard:—

"The other example of mistaken works is the Dying Mozart of Rinaldo Carnielo, also a young Florentine of unmistakable talent and skill. No sooner was it seen in plaster by the French Minister of Public Instruction than he ordered it in marble for the Conservatory of Music at Paris. It represents the composer in his last agony, emaciated by consumption, his meagre form sinking backward in a high-backed, capacious arm-chair, with his head half buried in a large, square pillow. A voluminous ruffled shirt and heavy, long embroidered dressing-gown, completely muffle the body, but the ample folds, though somewhat sketchily and heavily executed, give perfect suggestion of the underlying shrunken anatomy. The tapering, thin hands are exquisitely modelled, and quite in character with the delicate, intellectual face, and long, thin neck. One has fallen lifeless on the just-completed music of the Requiem lying in his lap. The lips are slightly parted as the last breath is leaving the form, its warmth being still felt there when all else is cold in death. As a study of this supreme moment in a consumptive patient, Carnielo's work is faithful; for he closely watched its phenomena in the hospitals here from dying men. The expression is not painful, nor is it ecstatic, as if the spirit, recognizing its coming joy, imprinted in the still pliable form some of its own 'peace passing understanding.' The artist has just missed the spiritual element by too earnest study of the material phenomena. These, with the well-wrought accessories, so overpower it as at first glance to embarrass the spectator in rightfully apprehending the vital motive. Besides the undue prominence given to mere accessories, Carnielo's statue exhibits too much the material outlook of an expiring mortal, as an anatomical study, and does not sufficiently bring to view or suggest those more subtle distinctions which make the vast difference between Mozart and common men, irradiating his mortal frame with specific genius and filling all men's minds with undying sentiments of love and admiration. This higher law of human nature and of art the old masters recognized and strove to obey. But it is not the art-creed of men of Carnielo's stamp. Disbelieving alike in the classical theory of the beautiful and the spiritual idealism of the mediævalists, they plant their art on solid realism and uncompromising eye-fact. There is, however, strong characterization of its kind in whatever Carnielo undertakes. An intellectual head of an old man in his studio, despite its super-emphasized wrinkles and organic decay, though not æsthetic, is wonderfully artistic. But it stringently proves that the whole truth should not always be told in art any more than in society. Art is always greatest and loveliest when most creative and suggestive and least in bondage to literal, material fact, or nature in the limbo of physical science. Consistent to his view of art, Carnielo has modelled a series of sepulchral monuments in the form of sarcophagi, with figures of men or women lying on them dead, or bending over them in profoundest grief. Their tableaux-pose is admirable modelling and thoroughly life-like, but the costumes are the fashionable attire of the hour, carefully executed to the minutest details. The male mourners are dandies with canes, hats and garments of the last stylish cut, and the ladies wear Worth dresses of richest patterns, with elaborate trains; freshets of costly dry goods overflowing the ground on which they kneel, while their immaculate boots, fans, head toilets, and similar paraphernalia are so perfectly *à la mode* as to lead one to suppose their figures are really intended for sculpturesque fashion-plates, with a dash of spectacular grief in graceful attitudes for a romantic background. Certainly, nothing could be more opposite to the usual associations of bereavement and the grave-yard than these exquisitely modelled little manikins. They are artistic without being art. It is a serious misfortune that the best talent of the day should seriously put forth such work as genuine art, but it is the natural result of believing in picturesque sculpture."

THE COLOSSEUM.—A writer in the *Athenæum* says that the excavations of the Colosseum which were begun in 1874, by Signor Rosa, had no other purpose "than to avoid the profanation of a moonlight masquerade, which the Carnival committee of that year proposed to celebrate within the amphitheatre."

THE ELGIN MARBLES.—Haydon tells us that while he was studying and drawing the Elgin marbles in the British Museum he often noticed a visitor who seemed to belong to another social class than the students who were in the habit of studying these sculptures. On Inquiry he found that the person was a riding master who was in the habit of bringing his pupils to the Museum to show them what a good seat was.

HEALTH CONVENTION AT ATLANTA, GA.—The following circular has been issued by the National Board of Health:—

WASHINGTON, April 19, 1879.

The National Board of Health will convene in special session at Atlanta, Ga., on Monday the 5th of May prox., and continue in session contemporaneously with the American Medical Association, which meets in regular session at the same place on the 6th of May. The importance of an early interchange of views and the absolute necessity for consultation with health officers, quarantine physicians, and sanitarians generally, throughout the United States, has led the National Board of Health to make known its contemplated meeting at Atlanta, and urge upon all persons interested in matters of sanitation, whether municipal, State, or National, to be present and counsel with the Board. It is earnestly hoped that not only every State, but that every municipality in the whole country will be represented, in order that a step may be taken towards securing a general system of health and quarantine regulations, and by such a gathering of the prominent sanitarians of the United States, the interests of all sections may be promoted.

By order of the Executive Committee. THOMAS J. TURNER,
Secretary National Board of Health.

SCULPTURED BRICKS AT NINEVEH.—One of the curious things found by Mr. Hormuzd Rassam in his excavations at the site of Nineveh is a water conduit built of bricks which had evidently been used in some building above ground, for each of the bricks bore on one of its faces a portion of a human figure in high relief. Already the crossed arms, the lower part of the face, and a foot have been found. The bricks or tiles are about twenty inches square, and three and a half inches thick. It evidently took about twenty tiles to cover the full height of the figure found. The bricks are well baked, and the figure was evidently carefully modelled.

THE CONTENTS OF A ROMAN FOUNDATION-WALL.—In pulling down a foundation-wall near the Minerva Medica at Rome, there have been found (employed as building materials) not less than seven statues and about 1,200 fragments of other works of art. The best, and best preserved, statue represents Bacchus and a leopard, the group being five feet high. The other figures represent a faun with a basket, an emperor of the fourth or fifth century, a consul of the same period, nine feet high, a girl with the head bending on the right shoulder, which is thought to be of Greek workmanship, a draped female figure nursing her baby, etc.

A METHOD OF COPYING DRAWINGS.—A new method of copying drawings, which is said to be useful when a couple of dozen copies or so are wanted, has been brought out, says the *Building News*, in Paris. The apparatus consists of a shallow zinc tray, in which is contained a smooth, jelly-like, cream-colored substance, resembling in some degree partially solidified flour-paste. The drawing to be copied is made with a special ink. As soon as it is dry it is turned face downwards on the contents of the tray. The back of the drawing is then rubbed over with the hand. The sheet is then lifted up, leaving much of the ink transferred to the substance in the tray. A sheet of clean paper now takes the place of the drawing, and by rubbing it over gently with the hand, an accurate copy of the original is obtained. With care, as many as one hundred copies can be had. When all that are needed have been taken, the composition in the tray is washed with a damp sponge and is then ready for use again. The nature of the composition has not been made public.

A NEW TELEPHONE.—There has been recently exhibited to the French Academy a telephone with some novel features, and said to give remarkably good effects. It is the invention of Mr. Gower, an American. He uses very strong magnets, made of the best French steel known, and magnetized by means of a large electro-magnet, deriving its current from a powerful Gramme machine. The magnetic bar is bent in a semicircle, with its ends or poles projecting inward, and having each a small oblong piece of iron, on which is mounted a coil of wire. These parts are inclosed in a shallow cylindrical brass case, the cover of which carries the vibrating membrane (rather thicker than usual), separated from it by an excessively thin chamber, and attached by means of a brass ring and screws (which latter do not touch the membrane at any point). The old form of telephonic mouthpiece is abandoned, and a flexible acoustic tube, with mouthpiece, is attached to the middle of the cover. Thus, one may speak sitting at a table while the telephone is attached to the wall. Perhaps the most novel feature is the use of a telephone call, consisting of a small tube, bent at a right angle, and containing a vibrating reed; this tube is fixed on one side of the membrane. On blowing into the acoustic tube this reed is vibrated, and, consequently, also the membrane, which then moves in excursions large enough to be felt with the finger. A correspondingly strong sound is produced in the receiving telephone through vibration of its membrane, which sound may be perceived in a hall of any size, and even (from its peculiar *timbre*) when other sounds are present. The tube with the reed in it does not injure, but rather improves, the distinctness of transmitted speech. Simple phrases spoken with a loud voice into the transmitter are heard as far as five or six metres from the receiver,—a result never achieved before.—*The London Times.*

THE EFFECT OF OZONE UPON SEWER-GAS.—The experiment of disinfecting sewers by means of ozone produced by the electric spark was tried in London recently. Twelve hundred cubic feet of sewer gas were inclosed in a receiver, and a torrent of nine-inch sparks from a powerful Ruhmkorff coil was passed for one hour. Then the ozone was allowed to act for twenty-four hours. At the end of that time it was found that the sewer gas was for the most part unchanged, although deodorized to a considerable extent. A second experiment was tried, by placing a quantity of decomposing sewer filth in the receiver, and again introducing the ozone. After twenty-four hours the inclosed gas was drawn off and fresh ozone introduced. It was then found that the putrification of the mass proceeded much more rapidly in ozone than in air, but that the effluvia and the mass itself were entirely destitute of those bacteria which are supposed to be the cause of zymotic disease. The experiment, therefore, was a partial success, although the great cost of this method will prevent its general introduction and practical use.—*Exchange.*

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CONTENTS.

A CORRESPONDENT, "E. A.," in another column writes to us in answer to a paragraph in which we spoke of hostility to architects on the part of mill owners and underwriters (*American Architect*, April 26). "Hostility" was a word carelessly used, which, but for a slip in proof-reading, would have been changed to something less positive. But our correspondent's letter itself gives evidence that there is a certain distrust of the service of architects among the classes we mentioned, — a distrust which was doubtless founded partly in reason, and has been maintained, perhaps, by mere want of acquaintance and misunderstanding as much as by anything else. Builders of mills who have wanted somebody to plan them have cared little or nothing for their architecture, but have had certain well-defined practical conditions to meet, for which they did care. Architects who have built mills have had their minds occupied with ideas of their own, and, not being familiar with these practical conditions, have too often neglected to study and provide for them. The owners have found that engineers, by the nature of their occupation, were more prone to concentrate their attention upon these conditions, or have turned to builders as men whom they could more directly order in the carrying out of their work, and who asked no fee for architectural services. Thus the failure of a few architects to realize the importance of special study of special conditions and of adapting their usual habits of design to them has gone far to disfranchise their whole profession for this branch of employment. Yet the construction of mills is simple, and might as well have been thought out by architects as by any one else; while to design them well in accordance with this construction is difficult, and cannot be well done by any one but an architect. It is likely that if owners had taken the same pains to impress their requirements upon architects that they have with the builders whom they have employed, they would have had mills just as well planned and constructed as they now have, and more comely. But it was perhaps hardly to be expected that they should take such pains, and it is more than possible that architects did not encourage them in it. On the other hand, it is probable that if all the architects (few, we suspect) who have designed mills had studied their practical requirements, with care to adapt themselves to them, the profession would have gained an opportunity.

IT is desirable that mills and factories should be made architecturally as presentable as possible, for they and like buildings give its whole character to the aspect of many of our towns, and of the outskirts of most large cities. Three or four centuries ago they would certainly have been made picturesque and interesting, and perhaps we may yet make them so, more or less; at present they are unspeakably dreary and repellant, and their fault is not merely that they are ugly in themselves, but that they spoil whole towns which might else be attractive. If their owners are indifferent to this now, it is safe to believe that they will not always continue so. Our architects are in better condition to turn the problem to account than they were a few years ago, for they grow every day more independent of traditional forms, which do not meet this want, and more capable of adapting their design to new exigencies. But one thing is to be considered, which, we dare say, has not been thought of by those whom it concerns. It is only the most skilful architects who are likely to treat the problem successfully, at least until these have shown the way, for it is essentially a new problem to us. The long, horizontal lines, square masses, flat roofs, multiplied windows, regular subdivisions, and scanty ornamentation which are demanded are certainly susceptible of interesting treatment, but they want a very different handling from the narrow city fronts and picturesque or fantastic country houses on which our architects form their habits of design. Their very simplicity is a severe tax to the architect, who cannot avail himself of his ordinary means of effect. They call for one who has force and flexibility of design to treat a new and difficult subject in a simple, natural, and effective way; and this is what only the most capable can do. "E. A." suggests that we should invite from our contributors designs for a large factory building, with specifications and details of construction, which we may compare with others which he kindly furnishes; but this, as our correspondent probably forgets, would be — in case our contributors should be of those to whom the distrust of owners and underwriters has not given occasion to provide themselves with plans of such work already executed — to call on them to furnish several hundred dollars' worth each of work, simply to show what they could do. Building committees do not hesitate to do this; but, with the opinions we have upheld concerning competitions, we should not like to draw so heavily on the good-will of our friends, nor could we hope that busy men of the profession would have leisure to answer to our appeal.

OUR correspondent cites the manner in which churches, warehouses, school-houses, and hotels are built so as to make them liable to burn, and asks whether — assuming that he is right in calling it a greater hazard to insure these buildings than factories used for the extra-hazardous business of manufacture — it is not "time to question the capacity of those who under the name of architects have constructed these buildings." The answer depends on how far the architects are responsible for the system on which the buildings are constructed. As a matter of fact, this system is one for which the present generation of architects is not responsible at all. It is a system devised in all its dangerous essentials when there were practically no architects, and was worked out in its details chiefly by builders and mechanics with a single eye to cheapness and convenience of working. Our lath and plaster partitions, thin scantlings, hollow floors, and walls furred into continuous flues were all contrived when our people had before their eyes not the dread of fires, but the dread of wasting money; having a great deal of building to do, but not, as the world goes, a great deal of wealth, and building rapidly, in a facile but perishable material. The system has so thoroughly pervaded the country, is so minutely adapted to the habits, tools, and machinery of mechanics, or they to it, and suits in so many ways the notions of our people, who are still bent on haste and cheapness, and wish, if they spend their money, to spend it on something that shows, that it is extremely difficult for architects to make head against it.

THIS is a purely vernacular growth, which has survived its usefulness, for our cities at least, which our better architects dislike, but which is still too strong for them. Most of the ameliorations which have been contrived, as, for instance, in the churches which "E. A." denounces, the walls lined with visible brick facings, finish of tiles or terra cotta, open-timbered roofs instead of flat ceilings, solid posts for hollow piers, are the work of architects. These things one finds in some measure in the cities where there are capable architects; but in the country towns where there are none, he sees the "florid shingle" church, full of flues and hollow spaces, of flat ceilings, and all the provocations of conflagration. Architects have labored hard in many cities to contrive and urge building laws which should enforce secure construction. They have been impeded and sometimes defeated by the opposition of mechanics and speculators, but what has been gained is mainly due to them. The habit of their day and the desires of their clients are against them. The normal condition of church committees, building committees, and of most private clients is a desire to get more for their money than it will bring. Their architects know that it would be worse than useless to propose the methods of construction they would like to adopt, — methods which depart widely from those in common use, — when even the requirements of the client will outrun his limit; for the average client wants to put his money where it will show, and display is cheaper than construction. That architects — or any

other class of men — do all the good they might, we are very far from asserting. We know, however, that their influence is steady, in spite of a great deal of difficulty and opposition, for the improvement of building construction. The way of reform is hard; but if underwriters and architects should join hands, it might be made easier.

The tenement-house movement seems to be taking practical shape in New York, and to be awakening not only the zeal of philanthropists, but the interest of capitalists, and especially of real estate owners. The committee of nine appointed by the meeting at the Cooper Institute (*American Architect*, March 8) submitted a preliminary report two or three weeks ago. It decides, in view of the late competition, that the ordinary twenty-five by one hundred feet lot is not suited for a tenement house, but that larger plots must be used, and recommends that one or more stock companies be formed for the building of suitable houses, which can, it declares, be profitably built. For the formation of such a company the committee offers a scheme, proposing that it shall have a capital of half a million dollars, with power to increase it to two millions, in shares of one hundred dollars, in which tenants and all classes of men shall be encouraged to invest; that it shall build plain, substantial, wholesome, and fire-proof buildings on lots not less than a hundred feet square, or their equivalents; that the dividends shall be limited to five per cent, and all surplus earnings be invested in United States bonds for a construction fund. The buildings should be regularly inspected, no liquor-selling permitted in them, the rents collected weekly and not allowed to go in arrears. The committee also suggests the establishment of a permanent gift-fund of a million dollars, which is to be subscribed in sums of five thousand dollars, and put in trust, to be increased by further gifts or reinvestments. The subscribers would elect a board of unpaid trustees, who would invest and reinvest the fund and its income in improved dwellings for the laboring population of New York. This last proposition seems to us to have two sides. The accumulations of such a fund, if shrewdly managed, would in a generation or two become enormous, and in a city like New York would be, if it fell into the wrong hands, a political engine of dangerous power; while the controlling franchise purchased by the subscriptions would have no commercial value, and therefore no security for being kept in the possession of men who could be safely trusted with it. How far the movement has advanced since the report we do not yet know, but it is said that a subscription for a stock company was opened with fair success.

Newspapers report an independent meeting of certain capitalists, who proposed subscriptions among themselves of ten thousand dollars each for building a model tenement house. They too rejected the ordinary city lot, and have declared for a quadrangular building, apparently favoring a plan by an unnamed architect which has been published in the New York *Herald*. It is a convenient arrangement of rooms in a quadrangle, on a lot two hundred feet square, exposed on all sides and inclosing an open court one hundred feet by one hundred and ten. It is thought that the one hundred and eighty-five tenements and shops provided in this place could be rented for an average of one hundred dollars each per year, at a profit of eight or ten per cent on the whole investment. There is no doubt that some form of quadrangular arrangement must be adopted for the model tenement house, since it gives the maximum of frontage, that is, of light and air, with the most economical use of open area. These movements have naturally attracted the eyes of the owners of unoccupied land, and there have been profuse offers of plots of the requisite size at rates varying from $250 to $3,000 for the ordinary lot (of twenty-five by one hundred feet).

While the future of the national monument to Washington still looks precarious, and the funds for its completion are not to be seen, there are lesser undertakings of the kind which promise more success. Nearly fifty years ago, at the time of the centennial celebration of Washington's birth, some citizens of Philadelphia formed a society to build a monument in memory of him, and a corner-stone, furnished by the marble workers of the city, was laid in Washington Square. Here as in other cases the money raised fell short of the intention, and though about forty thousand dollars have been accumulated in the hands of trustees, the work has never gone on. In the mean time the Pennsylvania branch of the Society of the Cincinnati had been also accumulating a fund for a monument to Washington, which they had projected as early as 1811. This fund too has been gathering until now, and amounts, we are told, to a hundred and thirty thousand dollars, with which at last the Cincinnati are preparing to build their monument, hoping to have it finished in 1881. Whether Philadelphia is to have one or two monuments does not yet appear. It has been suggested that the funds should be put together for one, — a proposition which sounds reasonable, for it hardly seems worth while to build two new monuments to the same person in the same city, one of which must probably outshine the other. The Cincinnati, it is said, are disposed to put theirs in Fairmount Park, and have invited models from different sculptors, among whom Mr. Thomas Ball has furnished one that is considerably praised. Mr. Ball is familiar with his subject, being the sculptor of the equestrian statue of Washington in the Public Garden, Boston, an admirable statue, and perhaps the best that we have of Washington, unless it be that at Richmond, by the French sculptor, Houdon.

THE RECIPROCAL DUTIES OF ARCHITECTS AND THEIR EMPLOYERS, ESPECIALLY IN RELATION TO PUBLIC BUILDINGS.[1]

II.

In regard to "the duty of architects as to appropriateness in their designs," several things are to be observed. In the first place, the authorities are by no means agreed that a structure should express its purpose by its exterior. Some critics insist that a house of worship should look like a church, and a house of imprisonment like a jail, and I am free to say that I am of that opinion. But others, equally entitled to consideration, contend that it would be just as reasonable to expect the tailor to label the merchant and the lawyer, the manufacturer and the teacher, by the cut of his coat. Many, perhaps most, competent architects and architectural amateurs would exclusively assign the so-called Gothic varieties of style to ecclesiastical structures, classic forms to public buildings for secular use, Renaissance and the various subsequent combinations of it with other motives to domestic uses. The temperate and equipoised Ruskin, on the other hand, would visit with condign punishment the designers of any example of the building art, from St. Peter's to a dog-kennel, rendered in lines outside of historical Gothic; and has placed on record his aspirations for the destruction by fire of the city of New York and the new portion of Edinburgh, because they are not architecturally conceived to his liking. A Quaker thinks that a barn to worship in is more conducive to spiritual gain than Westminster Abbey. A few sods with now and then a simple flat stone laid on them is all the sepulchre allotted to the vast majority of the sons and daughters of men, but the Shah Jehan thought the Taj Mehal — the superb structure that in Fergusson's opinion embraces the most beautiful and precious style of ornament ever adopted in architecture — none too good to mark the resting-place of his deceased wife. Who, then, is to be arbiter on the question of appropriateness in design?

I hope I shall not be considered a mere spokesman for my own cloth when I say that it seems to me not unreasonable that an architect should be allowed to be, on the whole, a better judge than the laity of how far the æsthetics at least of his design are appropriate to its uses. Reverting to the Jefferson Market Court House recently built in this city, — the alleged inappropriateness and extravagance of which opened in this society, as I understand, the discussion to which I am in my small way now contributing, — I confess that I do not see, for my own part, why the public money is not well expended in such a building. The community can well afford to pay handsomely for such a fine tower and such a judicious appropriation of a clever English design for the façades as the Court House affords, simply to look at, as a connoisseur looks at the pictures in his gallery. In the one case, however, thousands of people — the poorest as well as the richest, posterity as well as contemporaries — have, or will have, the daily privilege of enjoying a beautiful work of art, and they do this without reference to its uses; while in the other, the collector simply gratifies the æsthetical side of his own nature; or, at most, occasionally divides his pleasure, and that sometimes quite as much from a feeling of ostentation as from a higher one, with a few friends and acquaintance. But, dismissing the subject in its æsthetical aspect, the question will bear the closest examination on the most utilitarian grounds. Is it too much to say that the architecture of Italy, erected hundreds of years ago, has, combined with its other art treasures, by attracting sight-seers from all climes, proved one of the best investments ever made on the planet, and formed a permanent capital which has put bread into the mouths of millions of its people? Moreover, for contemporary purposes, a fine building greatly increases the value of the adjoining property. Buildings erected subsequently are more prone to be made to con-

[1] Read before the New York Municipal Society, by A. J. Bloor, F. A. I. A., on December 3, 1877, and presented November 14, 1878, to the Twelfth Convention of the American Institute of Architects, by whom it was referred to the Committee on Publications.

form, as far as possible, to its standard. The value of a lot depends on the value and uses of the contiguous buildings. Ground and house rent advance and the public treasury correspondingly gains by the proportionate increase of taxation (which is of course no excuse for a community submitting to the self-pocketed extortions of a Tweed ring). Real estate capitalists understand this. Neighborhoods are manufactured, as it were, under very large capitalists, by simply taking the initiative with a handsome church or a block of fine houses. The Jefferson Market Court House has probably, so far as real estate capitalists are concerned, excited the indignation only of those who have no property in its vicinity.

Reverting now to the question of excess of cost beyond estimate, in the case of public buildings, one other and most important element remains to be considered, among those I have not specified, and which it would exceed my limits and your patience to examine. I mean the political element. Changes of administration, the rivalries of political parties, and the conflict for spoil among the managers of those parties and their hangers-on, enter very largely, sometimes overwhelmingly, into the account, where important structures are concerned, *e. g.*, the New York Court House.

I have so far endeavored to cover, from my point of view, the question presented me, as to the duties and responsibilities of architects, and I have hinted at the reciprocal duties of their employers. But if you asked me to speak to you — as I must assume you did — not simply to confirm your own impressions, and possibly prejudices, but to let you know the result of a specialist's observations and reflections in matters pertaining to his specialty I shall be obliged to dwell a little longer on the duties and responsibilities of those who employ architects; which I have the less hesitation in doing as the more or less specific statement of my conclusions will carry with it suggestions — whatever they may be worth — as to remedies for evils which both architects and their employers doubtless agree should be remedied or ameliorated.

It seems to me then that, particularly in the case of costly public buildings, much good would be accomplished by the legal protection of architects, as far as possible, from the encroachments on their province of incompetent practitioners. This would not only insure better buildings, but it would make the selection — such selection being of course a primary necessity — of competent practitioners a much easier matter than now for the trustees of the public. Another desideratum is the choice of men of liberal education, as well as of prominence in business or official circles, for building commissioners, and in the invariable inclusion among them of architects of high standing, having no personal interest except as commissioners in the building scheme under consideration. But perhaps above all, an ameliorative project, as relating to important public structures, should include the removal of governmental building administration from what is called practical politics; in a word, it should include what is needed at the root of all public service in this country, — national, state, and municipal, — civil service reform.

If the question be raised whether radical civil service reform is possible under the present political conditions of the community, I am obviously carried beyond the duty assigned me in this place. Without therefore discussing that question, it seems safe to say that civil service reform should — alike for the protection of the public, of owners and trustees, and of architects and their artistic and mechanical coadjutors — include the whole building service of the community, whether it be in public or in private hands. It ought, I should say, to include the best system that can be devised for the supervision of the homes and other resorts — religious, administrative, educational, correctional, recreational — of the citizens of the whole country. I do not mean simply that the public administration of the building service should be infused with the scientific and artistic elements which belong to the profession of architecture, and not left to the merely and very incommensurate mechanical tendencies which at present so largely prevail in it; or that it should be brought up to its maximum possibilities as regards the architectural beauty and harmony which prevail in the principal cities of Europe, with results so satisfactory alike to the resident and to the traveller. This is indeed highly desirable, and there is, it seems to me, no reason why this country should not follow up its triumphs — in the taming of the wilderness, in the founding of a government "of the people by the people for the people," in the unprecedented prosperity and education of the masses, in its wonderful results as regards invention and commerce — by rivalling in turn the achievements of the art epochs of the Old World in architecture, as in painting and sculpture. But public administration has another mission as regards the practical phases and every-day purposes of the building art. In proportion to its facilities for acquiring popular suffrages are its duties to the masses, not only in an executive way, but in the prevention of disaster. Take, for instance, our own place of residence. During the quadrennial period of 1873-76 eighty-seven millions of dollars were expended in the city of New York in new buildings and alterations of old ones. Its building department has jurisdiction over thirty-two square miles of territory, including the Westchester district lately annexed. The duty of the department is, so far as its means permit, obviously not only to insure the safe construction of buildings in process of erection, but to prevent accidents to the life, limbs, and property of the city's million of inhabitants from the decay or other defective conditions of one hundred and five thousand existing buildings (in round numbers), including six hundred and fifty churches, schools, and hospitals, and one hundred and twenty-five places of amusement. Now leaving out of consideration the constant surveillance required for this wilderness of existing structures, surely an annual expenditure of over twenty millions for new ones should be guided by the best designs, and the construction involved in them executed under the best supervision that can be had. The real estate capitalist who provides ill-contrived interiors for his tenants to live in should be held to some account, and he who obtrudes a badly designed façade on the perpetual gaze of the public does it an enduring wrong. The fever bred by the overcrowded tenement house spreads to the millionaire's mansion, and public morals and mortality alike depend — to an extent which is only beginning to be realized, through the labors of philanthropists and statisticians — on the cleanliness, comfort, and health of the masses. Certain philanthropic associations in England have wisely adopted as a motto the English architect Godwin's phrase, "As the homes, so the people." If the phrase has an important meaning in the monarchies of the Old World, where the people — that is, as there understood, the masses — have so little influence on government, how much more significant is it in a democratic republic, where the votes of citizens, forced, by the grinding poverty induced by birth, drink, laziness, dearth of employment, or other misfortune, to live in pigsties, are bought up, for a glass of rum, by men of low aims and unscrupulous methods, but eligible as rulers; and to whose birthrights, habits, and prejudices those of the voters are often but little inferior. Yet is it not true that by far the larger portion of the structures of this community are, in their arrangement for — or perhaps I should say against — light, heat, ventilation, drainage, privacy, and decency, left to the haphazard of incompetence, or the deliberate omissions caused by the parsimony of owners, the rapacity of officials, or the trade rivalries of workmen? I shall revert to this point presently in its relations to conflagrations.

Outside of this continent there is not a country in Christendom where the government of the cities and towns does not include the supervision of their buildings by professional experts under the most precise and minute regulations as to material and manner of building. Every structure standing, or in process of erection, in London and its suburbs, except a few public ones, exempted by name, is under the control of one of a corps of architects, called district surveyors, while heavy penalties attach to any violation of the laws as enforced by these building experts. On the Continent somewhat similar systems everywhere prevail, though not always so perfect. The continental governments, however, generally far surpass that of England in their appreciation of and provisions for a most necessary element in any thorough system of home administration, namely, the mutual responsibilities of governments and the architects to whom are so largely, though it may be indirectly, intrusted the lives and health of the various members of their respective communities. The authorities of those old countries recognize much more readily than those of ours that if experts are held to public responsibilities they should in turn be protected from whatever impediments may arise from the ignorance or unscrupulousness of non-experts. But what do we find here? Not a single architect throughout the country on whom it has been obligatory, as in Germany, to earn, after long and careful tuition and a rigid examination, a diploma guaranteeing to the building public his competency, according to its terms, either as a full architect or as an assistant of some specific grade. The functions of the Board of Health in this city as to the hygiene of buildings are supposed to be mandatory, but it is understood that "practical politics" render much of its efforts almost nugatory.

Then as to immunity from fire what do we discover? Mr. Hatfield, a Fellow of the American Institute of Architects, has lately compiled from the records and reports of the Fire Underwriters some valuable statistics showing the heavy losses that are incurred by the country from poor construction and inadequate inspection of buildings. Excluding the great fires of Chicago and Boston — which swept away two hundred million dollars' worth of property — not less than one hundred millions per annum have been destroyed by fire within the territory of the United States and Canada during the last ten years; while during the last quarter of a century the losses have aggregated an amount which would have sufficed to render all the buildings fire-proof against a general conflagration. I will not detain you by going into the figures by which this may be proved; but asking you to take it for granted, I wish to invite your attention to its bearing on the future. Let us assume fifty years as the duration of fire-proof buildings, — not that from a constructional point of view they might not last for hundreds of years, but the constant and rapid changes in the commercial and social world lead to the as constant destruction of buildings. We will then be in a position to affirm that if we accept say two thousand millions as destroyed by fire during the last quarter of a century (all or most of which would have been saved if the money had, in the first place, been put into fire-proof buildings, under proper governmental restrictions and inspection), and if we make allowance for increase in the number of buildings during the next fifty years, proportioned to the probable fourfold increase in population during the same period, we are perhaps safe in predicting that, unless the community insists on a general system of fire-proofing, not less than sixteen thousand million of dollars will fall a sacrifice to the Moloch of fire in the United States during the next half century.

Moreover, let us reflect on the loss of life that has accrued from

the prevalent negligence in building operations. The recent holocausts at the Brooklyn Theatre and the St. Louis Hotel will at once occur to you. Of theatres alone considerably over a hundred have been burnt down in this country within the last twenty-five years. I have encountered no statistics giving the loss of life directly from conflagration, but it must have been very large; while fatal illness among the poor, resulting from the consequent want of shelter and loss of property, must also have been very great. Now there is no excuse whatever for such a state of things, though the reasons for it are very plain. Where thorough building laws are enforced, as in most of the great cities of Europe, fires are of the rarest occurrence. The communists of Paris in 1870 destroyed comparatively little by fire, not because they did not try to burn down the houses, but because the houses, the modern ones at least, would not burn. A letter of Powers the sculptor was extensively published a few years ago, in which he stated that during his residence of over thirty years in Florence, not a single building had ever been burnt down. In this country, however, or at least in this State, there is a large class of people who seem to think that houses should be built not so substantially that a fire department would be almost unnecessary, but with express reference to giving employment to firemen. At least there was no opposition, on the part of the community generally (though the association representing the architects and that representing the building mechanics of the city of New York jointly protested against it before the Legislature), to a bill transferring the functions of the Building Department — one of the principal duties of which is to see that buildings are proof against fire — to the fire department, the only ostensible duty of which is to put out fires and prevent the spread of conflagrations.

THE ILLUSTRATIONS.

FELTON HALL, CAMBRIDGE MASS. MESSRS. L. NEWCOMB & SON, ARCHITECTS, BOSTON.

This hall was built in 1877, to be used as a dormitory or apartments for students at Harvard College. It is 160 feet long and 46 feet wide, with a cottage attached in the rear for a janitor's dwelling. The first two stories are built of brick and sandstone and the third story is open-timbered work, shingled.

THE BOUNDARY AVENUE PRESBYTERIAN CHURCH, BALTIMORE, MD. MESSRS. DIXON & CARSON, ARCHITECTS, BALTIMORE.

This church is to be built on the outskirts of the city. The material is to be Port Deposit granite.

PROPOSED COUNTRY HOUSES, ST. JOHN, N. B. MESSRS. R. BROWN & J. C. ALLISON, ARCHITECTS, ST. JOHN.

These houses are intended to be built a few miles from St. John, and are designed to suit the requirements of middle-class people. It is proposed to build them in terrace form, with sufficient variation externally to avoid too much uniformity in appearance. In houses of this class ample closet accommodation is needed, and the position of the several fireplaces is important, as conducing to sufficient warmth during the winter months. The "hall stove," which is one of the essentials of the country, is placed in a curved recess, and from its position will distribute heat throughout the house, and the stove-pipes, often the most unsightly things in a house, are here carried to the smoke-flues without being obtrusively in view. As each house has a basement, the heating, if preferred, could be effected from below by a furnace; the smoke pipe taking the same course as shown for the hall stove. Externally, a departure has been made from the usual stereotyped style of country house in this district. So far as known there are no houses here modelled in the Old English style of half-timbered work, with projecting eaves, and carved woodwork in the gables. In the design shown the lower part of the building would be clapboarded and the upper part covered with vertical boarding with filletted joints.

DESIGN FOR THE LONG ISLAND HISTORICAL SOCIETY'S BUILDING, BROOKLYN, N. Y. MESSRS. PARFITT BROS., ARCHITECTS, BROOKLYN.

This is one of the designs rejected in competition about a year ago. The estimated cost was $64,650.

THE SPRING EXHIBITIONS IN NEW YORK.

THE NATIONAL ACADEMY OF DESIGN. — THE SOCIETY OF AMERICAN ARTISTS, ETC.

Each successive year we count on the Academy walls fewer pictures that are absolute failures or ludicrous mistakes — fewer attempts at art, showing a lack of all artistic knowledge. Mr. Hall, Mr. Cropsey, Mr. Ehninger, Mr. Loop, Mr. Julian Scott, Mr. Robert Weir, Mr. T. W. Wood, are no better than they were last year. But not many "impossible" pictures from outsiders are shown. One must confess, however, that such as Mr. Wells Champney's Wedding Reception, Mr. Willard's Jim Bludso, Mr. Thomas Moran's Woodland Reflections, and Mr. B. F. Reinhart's Crucifixion, are samples, each in its own way, of things to be avoided. If few very bad, there are on the other hand few very interesting pictures, few that show definite power or assuring promise. Mediocrity must be given as the formula of this year's work. There are only a few insignificant foreign pictures, none to put for an instant in the balance with the Bonnat or Henner of the last exhibition. The Munich students, from whom we have come to expect the best work on the wall, are this year very disappointing.

It will be allowed by many that there is no American painter who possesses better technique and has promised more than Mr. Shirlaw. We are watching for another Sheep-Shearing, — and what does he give us? A small interior (296) and a small head (206), pictures of merit, doubtless, as compared with their surroundings, but below Mr. Shirlaw's power. Their color, too, is less good than he can make it, and his third picture, A Burgomaster, with all its breadth and cleverness, is but an imitation of 17th century Dutch work. To say it is almost a plagiarism accentuates the fact that Mr. Shirlaw wields an admirable brush, but marks also the regret one must feel when he does not furnish that brush with more worthy themes. Mr. Wm. Chase and Mr. Duveneck fall under condemnation on another count. The latter shows a large portrait with an unfinished head and hand, the rest of the canvas an unmitigated mass of darkness. Mr. Chase's Coquette is a well-conceived and well-drawn face, with small attempt at modelling, or at finish of any sort. It is not sketchiness I blame in these pictures. A dozen outline strokes may be sufficient unto themselves, the result perfect in its way. And, on the other hand, an "impressionist" picture, where outline does not exist and where color is suggested almost without form, may have a value of its own. But a picture which starts to be a definite rendering and stops halfway cannot be more satisfactory than a half-written book, no matter how clever, or a blocked-out statue, though genius held the mallet. The divergences of method are great, — great as is the distance from the inch-wide sweep of Franz Hals to the polished surface of Lionardo, where brush-marks are no more to be counted than chisel marks on the lips of Phidias's ivory gods. But method of whatever sort should be consistent with itself, should accomplish all it aims at. Finish for the sake of finish is not desirable, but neither is incompleteness for the sake of supposed vigor. In Franz Hals as in Lionardo there is not a touch too many, nor a touch too few, nor a touch that falters or goes wrong. The brush may be broad and super-rapid, the strokes few and bold in consequence, but the picture is not incomplete. It is safe to say that before the roughest Franz Hals no one ever wished more labor had been bestowed; it is safe to name this as one's first wish before the two pictures I have mentioned, and before many another done by our younger men. And they show aptitude enough to make us impatient that the labor has not been given.

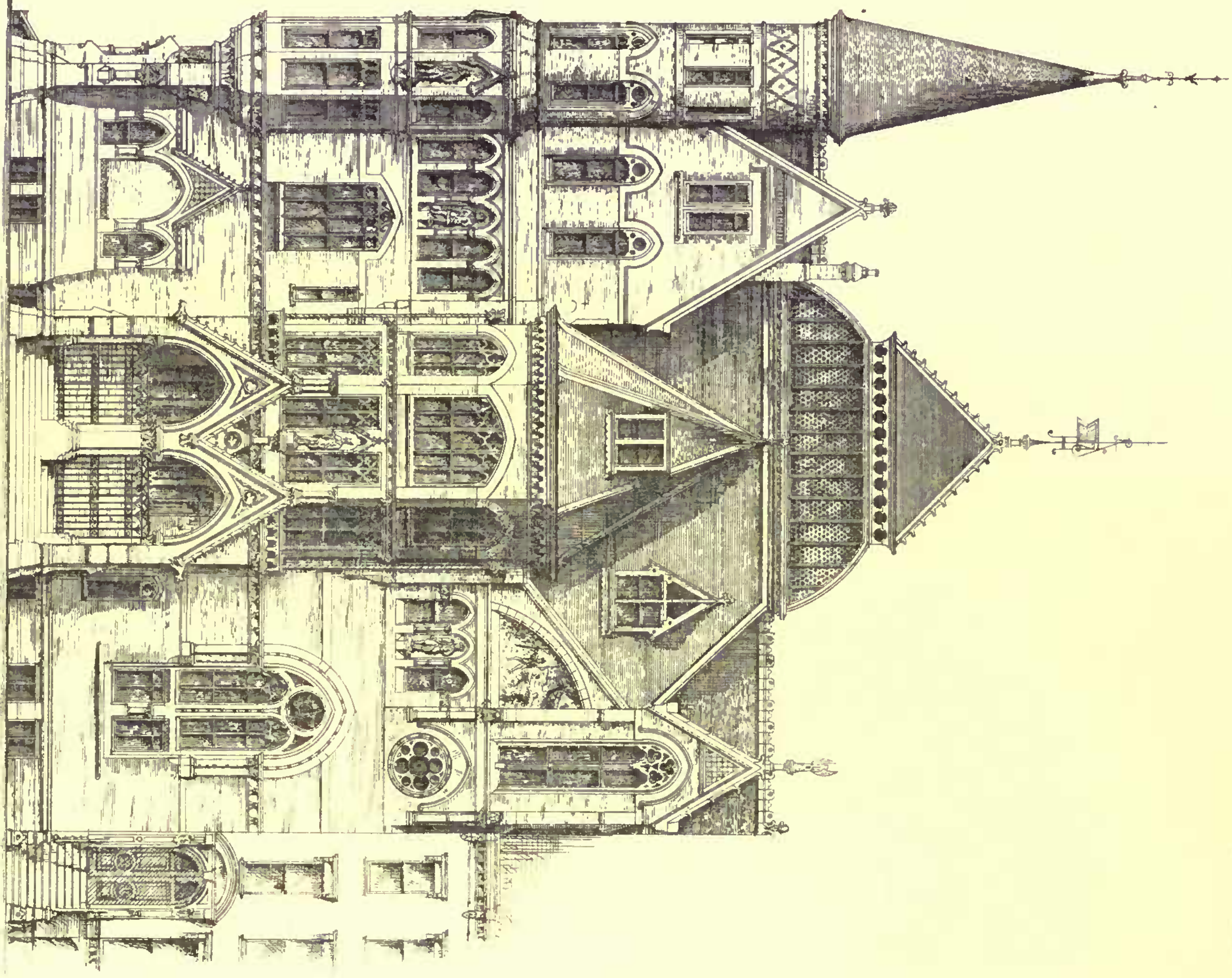
On the whole, Paris does better than Munich this year. Students of French methods give us the most important and the best-painted pictures. Three such hang side by side in the north room. Mr. Wm. Dana, N. A., sends from Paris a large canvas, On the Beach at Dinard, Brittany. It is cleverly done in the style that works with over-distinct outlines and a consequently somewhat flat effect. The two other pictures show comparatively unknown names, a Street Scene in Paris, the signature of Mr. T. M. Boggs, and Le Droit de Bris, that of Mr. Clement Swift. The former paints us a rainy day in some remote quarter of Paris, where the tumble-down houses, sprawling signs, and bedraggled pedestrians, though so thoroughly Parisian, are very unlike the things we usually feel to be latent in that word. The execution is bold, the atmosphere excellent, and the vigor and originality of the work quite admirable. Here we see the solution of the problem Mr. Tiffany tackled in vain in his studies of New York streets — picturesqueness combined with unflinching realism, and both drawn from the most prosaic aspects of modern life. It is the sky and the rain and the people and the *couleur locale* of Paris itself.

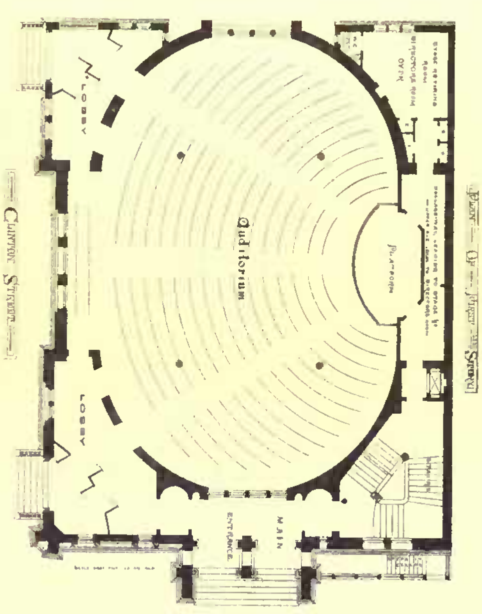
Mr. Swift's picture, three wreckers lying on a bank and looking through the breaking storm at a distant vessel, has similar merits. Its strength lies just where our painters usually fail — in the atmosphere and light, the avoidance of hard and "painty" effects, and the getting a picturesque subject from actual, contemporary things. The composition is simple and unforced, the dramatic interest of the scene suggested through its very tranquillity. The color is subdued but not sombre. There is a failure to render texture in the herbage, perhaps, but the values are well given. It is curious to contrast this canvas with other attempts to use familiar low-class life in the sphere of Northern want and hardness, rather than of Southern squalor and picturesqueness, — with Mr. J. G. Brown's fishermen, for example, or Mr. Winslow Homer's Laborers.

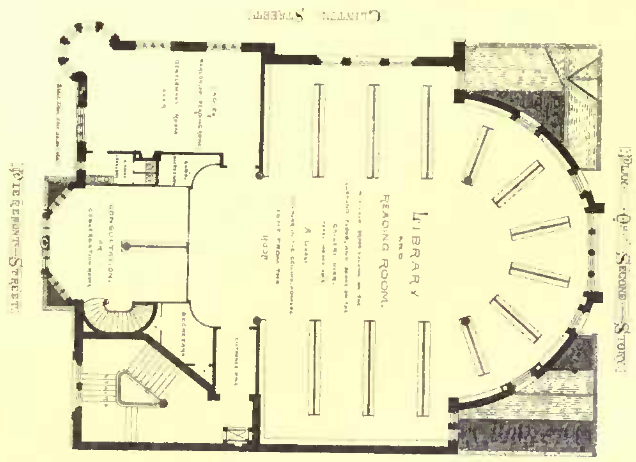
Mr. Edgar Ward's pictures are steadily improving. His Spanish interior, Paternal Pride, is very good indeed. It is a relief to see careful drawing and finish and a consistent scheme of color — consistent with itself and with nature as well — amid the rough conceptions and slap-dash methods that grow so wearisome. Mr. Frank Fowler's portrait of a lady (No. 156) is eccentric and rather startling. The color is unreal and the attitude affected, but in spite of all these faults, it is impossible to say the artist has not talent. Mr. Edward Moran's recent departure toward figure-painting seems to have been no unwise move. His French fisher-folk, though we do know the type a little too well, are very good, especially the large single figure, No. 337. Mr. Carroll Beckwith's portrait of a gentleman (152) is full of life, but the technique is hard and unpleasant. The more ambitious portrait, No. 346, cannot be called a happy attempt. The lady is full-length, — with a good piece of canvas to spare, — in a sort of Indian-red colored dress, elaborately and fashionably ugly in style. The foreground perspective is so bad that she seems to be

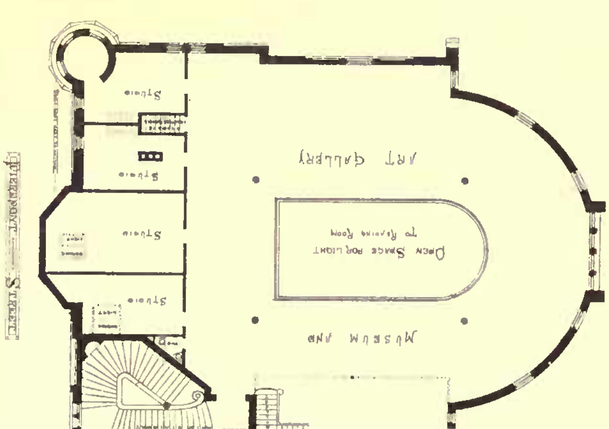
Design for the Long Island Historical Society Brooklyn.

Pierrepont Street Facade

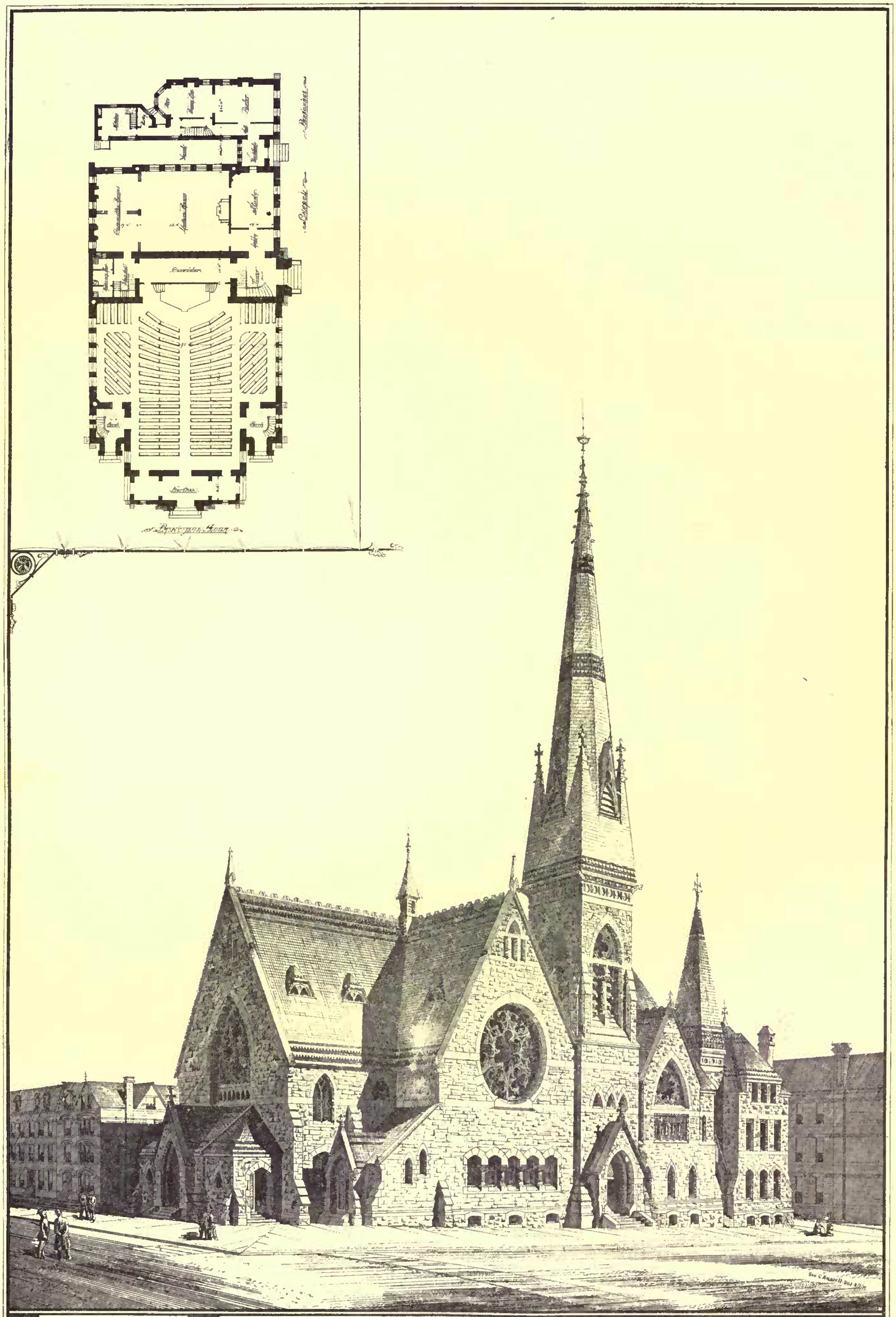






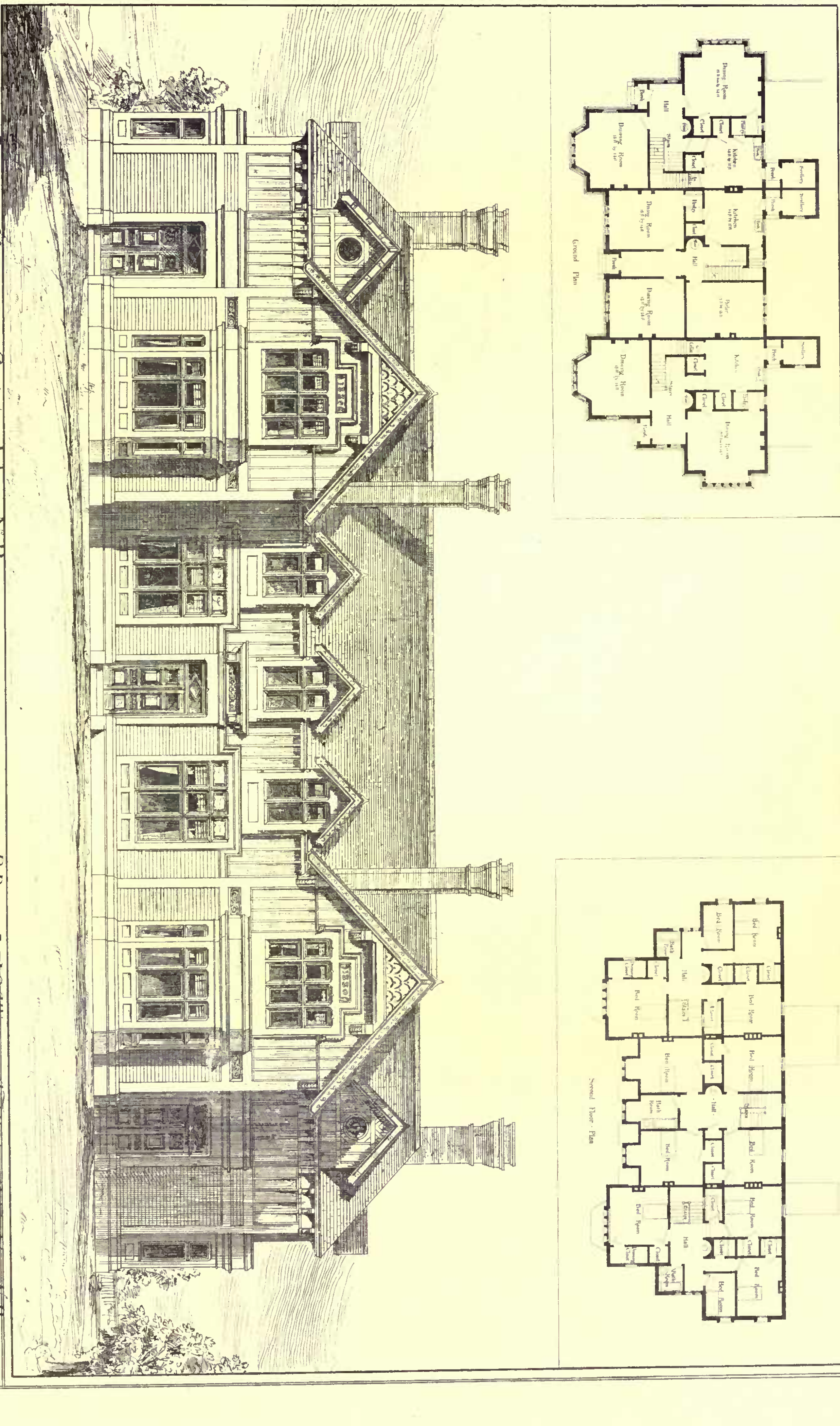


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Dixon & Carson, Architects. Boundary Avenue Presbyterian Church Baltimore, Maryland.

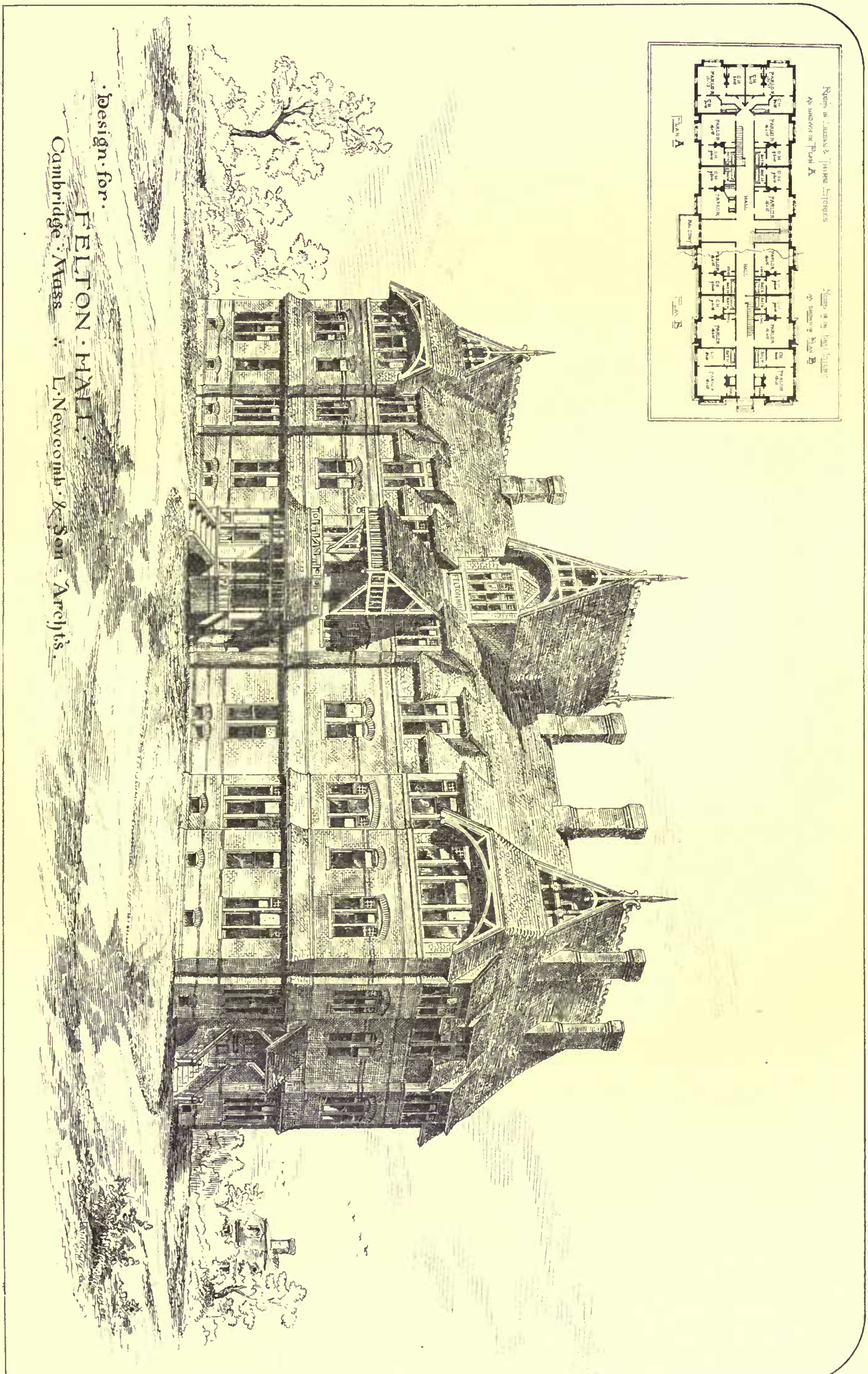
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standing on a pedestal instead of a fur rug. The head might have been much better had it been more carefully worked up. The pendent left hand is a capital bit of work. Mr. Beckwith has talent, — taste seems to be the thing he needs.

Leaving our Parisian-taught younger men and coming home once more, a curious contrast to this picture of Mr. Beckwith's may be found in Mr. Huntington's spreading canvas, No. 328, which balances it at the other end of the room. The President clings to his pinky flesh and conventional expression and black draperies. We are glad he does when we see what he makes of vivid color in My Cousin in Blue hanging opposite. Better than either of these is a third portrait, that of Judge Blatchford. Mr. B. C. Porter's likenesses fall below his last year's work. They are good, of course, but his color lacks depth and richness, and his touch grows effeminate in its softness, in its lack of vigor and accent. There are portraits by Mr. Eaton, Mr. Millet, Mr. Schledorn, and Mr. Witt, and studies by Mr. Encke, that deserve a word of praise, each in its own way. A very good head, No. 159, is credited by the catalogue to Julius Muniney, while the signature seems to read "Mulrancy."

Mr. Alden Weir's canvases are certainly curious. His manner varies from the hard, petrified effect of the Portrait, No. 412, to the fluffy indistinctness of another portrait, and of his Children Burying a Bird. Surely, from the pathetic to the ludicrous is but a single step and is perilously easy to Mr. Weir. Whether his hardness or his fluffiness is the more disagreeable it were difficult to say. There is a certain vigor about the former, however, that is his claim to attention.

If we look now through all the attempts at rendering humanity we find on these walls, we may very likely be struck by the fact that it is possible to misrepresent hair in an ingenious diversity of ways. It is a difficult thing to paint, of course, and may be variously treated, — broadly for its effects of light and shade and color, or elaborately for its texture. But it seems hardly necessary to make it look like fur or like feathers or like flax or like grainer's work in a door panel. And with Mr. Hicks it is sometimes maccaroni, as in No. 248, and with Mr. Alden Weir it is often wool, and once in a way black-walnut shavings, as may be seen by reference to No. 412.

Professor Weir, Mr. Quartley, Mr. Colman, Mr. Tiffany, Mr. McEntee, Mr. McGrath, Mr. Minor, Mr. Waller, show us works up to their average of excellence. Mr. Satterlee's Acquitted shows his best style in color, and the drawing of the principal figures is unusually good. But the heads in the foreground are utterly out of proportion. Mr. Winslow Homer abandons more and more entirely his better manner. The color in his Shepherdess of Houghton Farm is not bad by accident, it would seem, but by deliberate design. Especially may this be said of the raspberry-colored flesh. Sundown is comical rather than afflicting. Mr. Hosenden has three pictures, the most ambitious of which — What o'Clock is it? — cannot be called a success. The color is glaring, the paint itself more conspicuous than what it represents. Pendant le Repos is better, — well drawn and good in expression. The Challenge is very good in parts, although the subject of necessity invites comparison with the work of Vibert and of others as clever. Mr. George Innes shows a variety of work, — for instance, a pyrotechnic Sunset (131), an imitation of Corot (411), and, most prominent, a very large canvas called The Old Time Sketching Ground, North Conway, Spring Morning. This picture is hardly calculated to be embraced by a single glance, is panoramic or scenic in design. And it strikes one as being diluted rather than broad in treatment or large in effect. Mr. Eakins's Pair-Oared Shell is a clever piece of realistic work. A large portrait from his hand is hung on the very worst bit of wall in the whole Academy, and cannot possibly be seen. Mr. Muhrmann gives us some clever drawings in black and white and aquarelle, Mr. LaFarge only two water-colors of flowers, — one of which, No. 28, is most exquisite.

Having found fault with Munich for non-performance, I must on the other hand give a word of hearty praise to one of her youngest disciples, Mr. Twachtmann, whose landscape studies are bold, strong, and artistic, full of promise in many ways.

In conclusion I may say that the sculpture is more insignificant than usual, and the room where it is put is so dark that there would be small satisfaction in looking at it even if it were better.

The second exhibition of the Society of American Artists, which closed just before the opening of the National Academy, was not as satisfactory as we had been led to expect, nor indeed as satisfactory as the first. Mr. C. L. Pearce, for example, Mr. Milne Ramsay, and Miss Dodson, whose works last year were so interesting, this year sent nothing at all. And though the Munich men favored this rather than the Academy exhibition, they did not give us all we had a right to look for. Mr. Chase's portrait of Mr. Duveneck was very clever, though hardly pleasing as a composition, nor to be compared with the Ready for a Ride, of last season. His Baptistery of St. Mark's was also excellent, unaffected, and well finished. Mr. Shirlaw exhibited a careful study-head (No. 86), and his Gooseherd, admirably vigorous and expressive, if somewhat gaudy in color. And better still, a little Study, two women (No. 134). Mr. Duveneck's canvases were ambitious and showed some good work. Beauty of any sort he rarely seeks. Mr. Frank Currier sent some very clever heads, and Mr. Twachtmann more of his promising landscapes. Mr. Beckwith's Jeanne was far better than his usual flesh-tints. Mr. Will. H. Low fell beneath the level of his Jour des Morts of last year, and Mr. Frank Lathrop's Japanesey and disjointed figures, Eleanor and Rosamond, were of no value in comparison with the portrait he then exhibited. Mr. Fred. Bridgman's Siesta also was unworthy of his power. Mr. Frank Fowler's Bacchus was no Greek, and was cruel and vulgar rather than simply sensuous. Mr. Bolton Jones had a good Brittany landscape, Mr. J. M. Stone a clever portrait sketch (No. 51), and Miss Kibbe another (No. 88). Miss Cassatt's Portrait (No. 99) if less chalky in color, and Mr. Wyatt Eaton's Mirror if less soft and undecided, would have been better. Mr. George Fuller's smokiness is growing to be a fatal mannerism. It was less evident, however, in two or three pictures he sent to this exhibition than in those at the Academy. No. 70 was especially good. Mr. Alden Weir's scene, called In the Park, was commonplace in sentiment, raw in color, and out of drawing.

Two such artists as Mr. Wm. Hunt and Mr. LaFarge indorsed the new society in preference to the Academy. The latter contributed two beautiful flower-pieces and a tiny Venus Anadyomene, poetic in sentiment, masterly in execution, a gem in its way. Mr. Hunt had a strong and careful portrait of himself and a large Waterfall. The finish of the latter was precise enough to tempt to close inspection, when the tints were far too glaring. Across the room they found their true values, — all but those of the rainbow, which remained hopelessly opaque and vivid.

Further, there were deserving of notice a small and not very remarkable interior by Mr. James Whistler, and a large canvas by Mr. Eakins representing a surgical demonstration by professor Gross. This was realistic art, of a surety. It was in general very well done and in parts powerfully. The figure of the professor was admirable. But there were faults in the perspective of the subordinate figures and discordances in the scale of color, which was too sombre to be so intensely vivified by the blood stains.

Several collections of pictures by American and foreign artists have of late been sold for fair prices. Much the best was that of Mr. Albert Spencer, and here the prices were not only fair but very high; seventy-one pictures, almost all of small size, bringing $83,400. A Diaz that a few years ago sold for $800 now brought $2,700, and a Gérome with one figure and two dogs, $6,000. It was indeed a superb and characteristic specimen of his art, elaborate in the extreme, and showing his limitations as well as his powers. The color of the yellow drapery was magnificent, the lustre and tint of the accessories expressed with marvellous accuracy. Especially one noticed the *azulejos* of the lower wall. But the flesh of the man and the coat of the dogs were almost as smooth and polished as the tiles. A head by Couture, though not of his very best, acquired added value from the recent death of the painter. Mr. Boughton signed a curious specimen of the sort of thing so popular in England just now; Morning was represented by a woman evidently past her first youth, wooden of frame and morbid of face, with flesh and draperies of unwholesome greenish tint. It would be impossible here to note all this collection offered of excellence. I would but remark once more the perfection of the smallest and most unassuming French landscapes — simple in theme, unaffected in technique, yet full of the mystery and breadth, full of the life and movement of nature itself — grandeur achieved without violent color or unusual conditions, infinity comprised within a few square inches.

M. G. VAN RENSSELAER.

THE EXHIBITION OF CONTEMPORARY ART IN BOSTON.

I.

OUR vanity may be pardoned if we greet with enthusiasm the first exhibition of contemporary art at the Museum of Fine Arts in Boston. Not that the pictures particularly commend themselves to our admiration, though they are very creditable to an art community still in its infancy, but because the place and all its appointments are so perfectly adapted to a limited display of the fine arts. Certainly nothing has ever equalled them in that city, and on a similar scale nothing has ever surpassed them in other cities. Standing in the Allston room and glancing through the halls and corridor, the vista is more than pretty, it is imposing. It savors modestly of a European gallery, — of those stately galleries in which the masterpieces of the world are collected. There is something official in this exhibition that marks a new era. Owing to our political condition many years must elapse before the State can lend a helping hand to the fine arts. In the absence of State patronage it is to be hoped that art will enjoy the semi-official patronage of the Museum; that this institution will take under its protection everything in art that is worth protecting. We sincerely trust, moreover, that the first exhibition of contemporary art inaugurated under the combined auspices of the Museum, the Art Club, and the Society of Architects will not be the last.

We miss on the walls the large creative works which only governments, churches, or wealthy corporations can order, and which lend importance to foreign exhibitions. Without such works no nation can ever hold a foremost place in the hierarchy of art. Creative pictures there are, but they are reduced to a minimum both in size and in quantity; of portraits there are a goodly number, of *genre* compositions a few, and of landscapes a host.

Let us give the place of honor, as it should be given, to the offspring of the imagination, and first discuss the creative works. It is

a singular fact that the grandest pictures in the American gallery should be in dimension among the smallest. Vedder's Death of Abel (382) is one of the largest little pictures that we have ever seen. It is an old acquaintance, but none the less welcome. Could anything be more weird or primeval than the landscape? There is something almost human in the rich brown hillocks magnificently drawn against a luminous sky. The key-note of color is struck on the horizon line. In the immediate foreground, at the base of two rude altars illuminated by a fainter, cooler, more ghastly light, lies the dead Abel. There are two kinds of landscape, the one smiling, blooming, changeable, the other arid, sculptural, immutable. Vedder is enamored of the latter, and no one renders it better. His Fisherman (336) shows how much can be compressed into a few square inches. The color is delicious, and as for character, he suggests to us an old Roman fisherman who loafed about the quays of Ostia some 2,000 years ago. He belongs to the family of the shepherd tending his flock, unearthed in Rome a few years since.

The transition from Vedder to LaFarge is easy and natural. It would be interesting to know to what extent the one was influenced by the other. Years ago they were intimate, though the ocean has since rolled between them for more than a decade. LaFarge is the tenderer of the two, Vedder the more robust. The latter is master of his brush, which readily translates his ideas, while the former's pencil at times seems incapable of rendering his conceptions. When he succeeds he is charming. What, for instance, could be more bewitching than his Water-Lily (331), lolling dreamily on the pond? His Anadyomene, too, bears the same poetic stamp, though the composition is not irreproachable. LaFarge should leave to other men such subjects as Newport Beach (333). They belie his talent, which ought not to exhaust itself on what his humbler confreres can do better. Far inferior to Vedder and LaFarge are the others who have given vent to the imagination. Mr. Dewing's pictures (418, 471) cannot be pronounced a success, but they deserve a better place than his realistic brethren have seen fit to give him. The effort is worth something and should be encouraged. The line between the sublime and the ridiculous is fine and difficult to draw, a feat that Mr. Low (307) has not been able to perform. We must, however, praise his sweet sky, if we cannot his figure.

Among the portraits there are two, which for unpretending qualities are very distinguished. They have that quiet air of dignity which is so admirable in the old masters. No striving for effect in either pose, color, or handling. Nothing but the simple truth, sifted through the author's brain, purified, ennobled. These are Hunt's portrait of Mrs. Adams (405) and Staigg's portrait of his mother. Hunt's modelling is more masterly than Staigg's, but the latter's color is good and his sentiment sweet; Staigg's other portraits have not the same excellence, but we do not care to mar a handsome compliment by criticising what is less meritorious.

Messrs. Chase and Vinton are the exponents of the new ideas. To use a current phrase, "they go in for technique;" other qualities apparently are of secondary importance. Their pictures are thoroughly modern. It would be irrelevant here to discuss the tenets of this school, but elsewhere, for the benefit of our artistic future, they should be exhaustively examined. In his portrait of a Lady (337), Mr. Vinton shows himself the pupil of Bonnat. No one has ever equalled this Frenchman in giving relief to objects. His creative forms lack ideality, his paint at times is brutally applied, but the reality of his personages is astounding. Mr. Vinton's portrait has more relief than any painting in the room. The execution is clever, but cleverer still the device by which he has relieved the monotony of the black gown with the *boutonnière* of pansies. We should like to know his sitter. We feel somewhat as though she were playing second-fiddle to his brush, as did a well-known amateur not many months ago. Mr. Chase, in No. 320, essays a *tour de force.* "I'll paint my man in gray, and all the accessories shall be gray; still he shall detach himself from his surroundings." Some such feat Mr. Chase has dared himself to do, and he has done it. We sincerely congratulate him on his handling. The head is admirably painted, but there the portrait ends. The rest is superfluous. If a full-length portrait is to be attempted, the boots and trowsers should not be expressed by two or three strokes of the brush. When the picture is suspended on the wall, these unpoetical appurtenances are nearest the eye of the spectator, and should not therefore be too coarsely treated. In other respects Mr. Chase has sent us a remarkable picture, which none but a veteran's hand could have executed. Mr. J. M. Stone's portrait, No. 314, is a sincere piece of work, but too evenly overloaded with paint. In his efforts to be vigorous he has failed to give us the delicate transitions of light and shade that flesh always gives. He lacks suppleness, a quality which generally comes with years. Mr. Healy's portrait of Mr. Nathan Appleton (361) is — pardon us, we must say it — an intense Mr. Nathan Appleton, more Mr. Appleton than Mr. Appleton himself. Miss Oakey exhibits a sprightly portrait of "a very young lady" (403). Miss Oakey belongs to that class of female aspirants who, without much education, but with plenty of intelligence and originality, produce things which no well-trained man would dare. The head of a negro (449), by Mr. Otto Grundmann, is that artist's best work. It is broader and more effective than his other pictures. Mr. Grundmann is not brilliant, but he is painstaking, an essential quality for an instructor. His pupil, Miss Frances Osborne, exhibits two pictures. The one betrays the tyro; the other (433), Study of a Woman Knitting, is pearly in tone, and very creditable for a beginner. It merits a worthier place. We shall conclude this article by praising Mr. Wm Sartain's Italian Head (367). As far as type and execution are concerned it might pass for the head of a Frenchman painted in the days of the Directory. There is a strange fascination about the pensive head, a mysteriousness which the dark, impenetrable shadows serve to heighten.

AMERICAN INSTITUTE OF ARCHITECTS.

BOSTON CHAPTER.

The last regular meeting of the season took place at the Architectural Library of the Institute of Technology, vice-president Sturgis in the chair.

The following Resolution of the Board of Trustees of the American Institute of Architects, passed April 18, was laid before the meeting: —

Resolved, That owing to the strong expressions of dissatisfaction and protest against the assessment levied at the last annual convention for the purpose of publishing its Proceedings and those of the previous year, it is the opinion of the Board of Trustees that they should take it upon themselves to act for the interests of the Institute; the Treasurer is therefore directed to hold in trust the amount collected and not used for the purpose named; and the whole matter be held over for instructions from the next annual convention.

Letters from Joseph T. Clarke, junior member, were also read, reporting progress in the prosecution of his archæological researches in Europe concerning the Greek Doric order, undertaken mainly under the auspices of this Chapter. One result of his preliminary studies in Munich is an Essay on the Hypæthral Question, which has been published by the Harvard Art Club, under the supervision of Professor Norton. The reading of this essay, and a discussion thereupon, formed the principal business of the present meeting. The walls were covered with illustrative prints and photographs; and drawings setting forth the theories of Beulé, Hittorf, Fergusson, and others were displayed. The views of Mr. Clarke regarding the manner of lighting the Greek temples are entirely at variance with those now generally accepted by archæologists. He argues that there is no sufficient authority either in the remains themselves or in the texts of ancient authors or in medals, coins, or models, to sustain the theory of an opening of any kind in the roofs of the temples; that the famous passage in Vitruvius, upon which the whole hypæthral theory is based, is at best obscure, and that the testimony of this author is not conclusive in regard to questions of Greek art; that the chryselephantine statues and the treasures of art accumulated in the temples were not of a nature to sustain the changes of temperature to which they would have been subjected by an opening to the outer air; that the genius of the Greeks was opposed to the use of such elaborate mechanical contrivances of shutters, etc., as must have been needed to exclude the rain and dampness from the interior; that the mystery which was a part of the hieratic system in the worship of the Greeks, as of the Egyptians, would have been far more effectively sustained by the light of lamps and torches than by the familiar light of day; that the example of the Roman Pantheon has no bearing upon the present question; that the structure of the Greek Doric temple is such that no light could be introduced through the roof without leaving large dark spaces in the area within; and that Mr. Fergusson's hypothesis of a clerestory is foreign to Greek methods, and is not in accordance with the text of Vitruvius.

After a general discussion of the question by the members present, and a proposition to change the evenings of meeting in the session beginning next autumn from Fridays to Wednesdays, the meeting adjourned.

ANCIENT ARCHITECTURAL MOSAIC.

Forty years ago mosaic might have been reckoned among the lost arts so far as this country [England] was concerned. It was treated as a subject of curious archæological study, and considerable interest of a dilettante kind was taken in it, but of English mosaic there was absolutely none, nor had there been for centuries. The latest examples then known dated back to the period of the great mediæval art revival about the time of Henry III., and even then the art was a sickly kind of exotic, practised chiefly with imported materials and by foreign workmen. The modern revival of the art commenced in the year 1839, with an extensive and elaborate inlaid pavement by Mr. Blashfield, after designs furnished by H. S. Hope, Esq., at whose country seat, Deep-dene, in Surrey, it was laid down. This pavement was formed of asphalte, colored cement, and Venetian pisé work.

In what country, or at what period, the art originated it is difficult to say. In the Egyptian Department of the British Museum there are some mosaic tesseræ, and portions of the capital of a column with inlaid mosaic work, recently brought from a building at Tel-el-Yahoudeh, which is said to be of the time of Rameses II., or, at all events, of far earlier date than the time of the Ptolemies, which has hitherto been said to have afforded the earliest specimens of Egyptian mosaic. There are also, in the Assyrian Department, examples of small mosaic work inlaid in ivory ornaments, from Nimroud, but they are mostly of Egyptian type. Hence we may infer that the art originated in Egypt, and was thence transmitted to the East. Pliny mentions several Greek mosaic artists of great celebrity, particularly

Sosos of Pergamos, but no original specimens of their work have survived to the present day. An ancient Roman copy of the celebrated work of Sosos, known as "Pliny's doves," is to be seen in the museum of the Capitol at Rome. The only other Greek mosaic now existing is a pavement discovered in 1763 at a villa near Pompeii, bearing the name of Dioscorides, of Samos, but it seems to have been only a copy of his design.

The art of mosaic was first introduced to Rome by Sylla about the year 80 B. C., when he returned home laden with the spoils of Greece and the East. It took the Roman fancy amazingly, and grew into surprising popularity, arriving at its highest perfection in the time of Hadrian, A. D. 117 to 138, and decayed at last only as the Roman Empire itself decayed. During the reigns of the twelve Cæsars the workers in mosaic are said to have been among the most honored artificers in the city of Rome, and no house or building of any importance was without its mosaic. Cicero describes the pavement of his own house as *lithostratum;* Seneca said that he should indeed consider himself poor and sordid if the walls of his house were not adorned with mosaic; Julius Cæsar, according to Suetonius, carried a mosaic pavement with him, to adorn his tent, through all his campaigns and progresses; and wherever the Romans settled themselves, in Africa, Spain, France, Britain, or the East, they carried the art with them, employing materials found or manufactured in the respective countries, when the marbles, or fictile tesseræ, of their own land were not attainable. The following is a brief description of the several kinds of mosaic work in use among the ancient Romans: —

1. OPUS TESSELATUM, or Tesselated work. This was the most ancient kind, and was generally employed for pavements, very rarely indeed for walls. It consisted of small cubes of marble, seldom averaging more than three quarters of an inch square, each of which had to be sawn or worked by hand into the shape required by the pattern. This was nearly always geometrical in design, worked out with the Greek fret and many other ornamental combinations. The colors employed at first were probably chiefly black, white, and red; but blue and yellow were generally introduced subsequently to the invention of the Opus Figlinum. The best examples are at Pompeii, in the Sala of the Nuovo Braccio in the Vatican, and in the Baths of Caracalla, at Rome.

2. OPUS SECTILE, or Sectile work. This was employed exclusively for pavements, and was composed of large thin slices of marble, not of little cubes. It depended for its effect, not upon the production of any particular design, but solely on the shape, color, and vein of the marbles employed. Owing to the extreme costliness of the materials, it was very seldom employed, and no examples are known out of Italy. The most noble specimen of it now existing is the pavement of the Pantheon at Rome, built by Agrippa, 27 B. C. In this splendid pavement the slices of marble are very large, porphyry, giallo-antico, and pavonazetto being the principal marbles employed. They are arranged simply in round and square slabs alternately.

3. OPUS FIGLINUM, or Fictile work. After the two former kinds had been for some time in use for pavements, a desire arose to employ mosaic as a decoration for the walls and curved surfaces of buildings. But for this purpose marble was often too costly, and did not possess sufficient variety of color for the more elaborate designs, hence the necessity for an artificial, or fictile, material. This was a vitreous substance, composed of silex and alumina, but with a larger proportion of silex than is used in modern times, and was colored by one or other of the metallic oxides. In the provinces of the Roman empire ceramic tesseræ were formed of the various clays of the neighborhood, as, for example, the fine mosaic at Woodchester, the most elaborate discovered in this country, was constructed with tesseræ made from clays now found in the neighborhood of Gloucester and the Forest of Dean. The vitreous material was also gilded by covering a thin film of leaf gold, spread over the material, with a thin plate of transparent glass, or with a fusible mixture, and fixing the whole by heat. The advantages of fictile tesseræ over marble were (1) greater variety of color; (2) facility of working; (3) cheapness; (4) endurance of polish and brilliancy; and hence the Opus Figlinum soon almost superseded the former kinds of mosaic, and "glassy walls," *cum aureo superinducto,* overlaid with gold, became quite common, and were treated by the writers of the times as signs of too great luxury. Many examples of gilded mosaic have been found at Pompeii, perfectly well made, as pure in coloring and as little obscured as when they were executed.

4. OPUS VERMICULATUM, or Curvilinear work, with its three subdivisions of Major, Medium, and Minor work, constituted the full development and perfection of the ancient mosaic. In this style mosaic took its place as one of the fine arts, and aimed at the direct imitation of all kinds of figures, ornaments, and pictures, in their true shades, colors, and reflexes, and used both marbles and fictile tesseræ, adding even jewels and precious stones when necessary, to heighten the effect. The Major work was used in large pavements, or ceilings, and presented mythological figures, gods, genii, etc., with various ornaments on a colossal scale. The cubes were of large size, not always square, but more often so than in the smaller styles, and the workmanship was coarse and rough. It was also employed in combination with finer work, for filling in the flat tints and large draperies. The surfaces, too, were usually left unpolished, being merely rubbed down. Most of the ancient mosaics found in this country are of this class, and the student should be cautioned that they by no means afford the best specimens of the ancient art; their workmanship being rough, and their manufactured tesseræ comparatively soft. They owe their long endurance partly to the extreme solidity of their foundations, and to their having been buried out of the way of wear and injury for ages. The Medium work was much finer, and was used for subjects requiring greater delicacy and softness of treatment. The cubes were smaller, and the workmanship finer. It was sometimes used for pavements, but mostly for walls. Fine examples are found at Pompeii. The Minor work was the finest and most elaborate of mosaics. It was used for portable pictures and for personal ornaments. Many of the strips were less than one twentieth of an inch across, and even smaller. It was finished with most minute nicety, highly polished, and rivalled even painting itself.

Besides the above principal kinds of ancient mosaic there were others of a peculiar and subordinate kind, among which may be mentioned that called by Pliny "the unswept floor." This was confined to the triclinium, or dining apartment, of dwellings, and represented the fragments of a feast which might have fallen down, and been left scattered on the ground in the utmost confusion. Pliny ascribes it to a Greek designer, in which case it is one of the few examples of bad taste produced by that nation. Another kind was the "*Opus incertum,*" in which all kinds of marble were put together in an irregular shape, united into a mass with cement, laid upon the floor prepared to receive them, and reduced to a polished face by friction. They formed a handsome and durable pavement, resembling Venetian pisé and Italian trazzo floors, as used at the present day. Another most eccentric kind was the endeavor to apply mosaic to figures in relief. A rude mezzo-relievo figure was formed, covered with plaster; and then portions of the surface were gradually chipped away, and their places filled with delicate tesselation. Very few specimens of this are to be met with.

For wall and vault decoration, after a smooth-keyed surface had been properly prepared, the tesseræ were fixed with a cement called *marmoratum,* applied in small portions at a time, composed of slaked lime and powdered marble in the proportions of one to three, and blended with water and the white of eggs. This was intensely hard and very fine, but had the disadvantage of setting almost immediately after its application, which rendered it impossible to displace any of the work, even for alterations during its construction, without destroying the whole. — *W. H. R., in Building News.*

THE ARCHITECTURE OF MILL BUILDINGS.

BOSTON, MASS.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — I have the honor to acknowledge the receipt of No. 174 of your paper, in which it is alleged that the modern cotton or woollen factory represents to the professional architect "the minimum of result and almost the maximum of wasted opportunity." "Knowing it for the work of the builder and the engineer, he knows too that its unsightliness is not essential to its strength or to its serviceableness." Granted in part. There can be no good architecture unless art and utility are combined in a consistent way.

The dreariness of the factory town and the want of appreciation of architectural effect is further imputed to the underwriters, and to them is also imputed "hostility to architects."

In reply to this last very serious charge I beg leave to say that it has but little foundation in fact. The factory underwriters are the factory owners insuring each other under a mutual system, and working through officers whose business it is to study the right methods of construction of the factory and auxiliary buildings, and to advise the owners what rules of construction they must follow in order to reduce the risk of loss by fire to a minimum.

The factory owners constitute a class who have given much employment to architects in the construction of dwellings, warehouses, and churches, and it has always been a matter of great surprise to the writer, especially after the great fire, that they have not required their architects and builders to adopt the same methods of construction and modes of preventing loss by fire that have compassed the safety of their factories. This will not be accomplished until professional architects cease to class the engineer and the builder as having a function in the construction of buildings separate and distinct from their own.

These officers of insurance companies, of whom the writer is one, have no hostility to true architects whatever, but as underwriters they are compelled to take the position of hostility to the work of very many of the professional architects, for the following reasons: In several cases in which the writer has had knowledge of their work, in the construction of factories, workshops, or other buildings intended for industrial purposes, they have constructed buildings that were either unsafe to insure, not strong enough for the work to be done in them, or unfit in some important way for their proposed use; or, else, the plans presented and sometimes adopted have involved an expense for mere architectural effect entirely inconsistent with the necessary conditions of the work to be done in the buildings. The writer could designate cases in which factory owners have incurred very heavy expenditures in altering the work done under the direction of the professional architect, in order to secure safety and fitness in the buildings constructed.

Furthermore the mutual underwriter distrusts the work of many of

the professional architects because in most of the city buildings lately constructed under their control or supervision the method of construction is such as to *assure the maximum of risk from the minimum of fire.*

Much attention has been given in these late years, by professional architects, to the building of churches. They have but to ask any underwriter and they will learn that with scarcely an exception churches are considered very bad risks, and for the best of reasons, since what are called brick and stone churches are very apt to burn. Next to churches the chief attention of architects appears to have been given to warehouses and shops. With few exceptions the new structures in the burnt district of Boston could not be admitted to the mutual system of factory insurance if placed separately near the factories and under the protection of their fire apparatus, because many of the worst faults of the old buildings that were burned have been repeated in the new. In very many of them also the use of the interior has been subordinated to the architectural effect of the exterior; hence they are not only unsafe but in some measure unfit for their purpose.

Hotels are among the worst risks taken by underwriters, yet in some of the apartment buildings now being constructed some of the worst faults and gravest causes of danger are being repeated.

School-houses can be constructed in such manner that no fire could exist in one under such conditions as to cause the danger of a panic among the children, such as was lately prevented in New York by the courage of the female principal. There is one private school-house that would meet this condition in Boston, but the last public school-house built could not be insured in a well-managed mutual factory insurance company, and the faults which make it unsafe have made its construction more expensive than a safe construction would have been. I think you will admit that if there is any ground whatever for the following allegation, which I do not hesitate to make, — that it is a more hazardous business to insure stone churches, city warehouses, and brick or stone hotels than it is to insure factories used for the extra-hazardous purposes of manufacturing cotton and wool, — it is time to question the capacity of those who under the name of architects have constructed these buildings.

In your comments upon the record of the fires in factories you cite in evidence of the alleged hostility of the factory underwriters to the architects that they (the underwriters) "even go so far as to provide plans and specifications" for factories. I send you herewith one of these plans, but before you copy it would it not be well to ask from your contributors sketches and specifications for a factory building, say 350 feet long, 72 feet wide, and four stories high? The elevation should be accompanied by a sectional plan showing the mode of construction of the floors and roof, and the specifications should give the detail of all the material to be used. You may then have the opportunity to compare our plan with any that may be submitted, and we may then ask the question, Which is the true architect, he who subordinates architectural effect to the conditions of safety and fitness for intended use, or he who sacrifices either or both of the latter to the former?

In the number of your paper which you have sent me I find eight pages of letterpress and four pages of illustrations; aside from the paragraphs to which this communication is a reply there is not a single sentence treating any question of the right construction of a building. In connection with the picture of a church, there is nothing to show whether it was really built of stone, or whether it is a stone sham screening a combustible timber church inside, or whether it is provided with such an arrangement for the furnaces as to make it safer to insure it to burn than to insure it not to burn; of which description of church I can point out to you several examples within the limits of an afternoon's walk from your office.

Will you kindly send me a number of your paper containing a study or design for a factory or workshop, in order that I may compare the method of construction of the professional architect with the requirements of the underwriter.

Very truly yours, E. A.

NOTES OF EXPERIENCE AND INEXPERIENCE.

17. Smoked Ceilings. — Probably the reason why in our two-coated plastering, the smoke and dust of a room soon reveal every lath and furring-strip, is that the compression of the mortar against the laths and furrings renders it more impervious to the smoke-laden air in those places. My experience is that the laths begin to show first, and the studs and furrings are revealed later, and that, if anything, the plaster is not so white over the furrings as over the laths. Perhaps the laths in Lath-and-Plaster's case may have been too dry, and may have sucked the moisture out of the mortar, thus diminishing its density. C.

20. Brick Drains vs. Glazed Drain-Pipe. — I have met a mason, who has had many years experience with the way in which drains work, who says that, given a brick drain and a glazed-pipe drain of equal capacity, the brick drain will keep itself cleaner than the pipe drain. I have seen a short line of drain pipe which, carrying the waste from the kitchen sink to the grease-trap, became so choked in a short time that it had been found necessary to run a pump-chain through it, one end coming out through the trap and the other just outside of the kitchen wall, so that by working it backwards and forwards from time to time a passage could be kept open. Will some one tell me whether there is any foundation in fact for my mason's assertion? Pump Chain.

21. Native Stones. — A few years ago, efforts were made to develop some native stone quarries. The writer would like to know whether any of the following stones can now be procured: —

(1.) Newburyport marble, — a beautiful, bright green variety.
(2.) Hoosac soapstone, — the compact, greenish kind.
(3.) Eastern marble, so-called, apparently a black serpentine.
(4.) Is there any quarry of the Saugus porphyry from which pieces of fair size can be obtained?
(5.) Why is not the Stoneham marble quarry worked?

It is rather humiliating to think that the Albany Capitol Commissioners send to Africa for purple marble, while our Saugus farmers build their pasture walls of porphyry, and that architects should be obliged to content themselves with black slate and granite for ashlar and columns, while the owners of a quarry of stone almost equal to black porphyry look on indifferent. Would it not be a good idea to begin an architectural museum, where architects can find where to procure the materials which they want only occasionally, but want very much at those times? As matters now are, if one wants a porphyry column, he runs about among all the dealers, who chill him by saying that it "would be impossible to work a quarry for one job," and in the end he has to use the familiar old red granite. The next week another architect has the same desire for porphyry, and meets with the same disappointment, and so on. Some means of combining the demand might lead to its being supplied. C.

22. Wells and Cesspools — Suppose that a tight cesspool is emptied through a line of tight drain-pipe, which in turn empties through ramifying lines of open-jointed land tile, what should be the least distance between the house-well and the first open-joint in the nearest line of land-tiles, the fall of land being good, and the well on the upper side of the system of drains? Open-Joint.

NOTES AND CLIPPINGS.

The Washington School-House Competition. — Twelve architects in Albany, Baltimore, Chicago, Philadelphia, and Washington were willing to accept the improper terms of the competition for a school-house at Washington, D. C., and have submitted designs.

Lifting a Railroad Bridge. — The iron shoes in which rest two of the spans, each weighing one hundred and eighty tons, of the long Lehigh Valley Railroad bridge at Easton, Pa., lately sank about an inch, thus throwing the bridge out of grade. As it was certain that the depression would continue, because the inside masonry of the pier is less solid than the outside, an iron casting twelve feet long, three feet three inches wide, and three inches thick, weighing seven thousand pounds, has been successfully placed under the spans by the use of hydraulic jacks. The work was accomplished without causing the stoppage of a single train.

Discoveries on the Viminal at Rome. — Signor Domenico Costanzi, the owner of the world-known hotel near S. Niccolo da Tolentino, is building the foundations for a Teatro Nazionale, a huge construction, which will afford accommodation for 3,300 spectators. It occupies the whole block between the Quirinal Hotel and the Vie Torino, Firenze, and Strozzi. As soon as the excavations began he discovered an ancient street, eighteen feet wide, following the summit of the Viminal and the watershed between the valleys of the Vicus Patricius and the Vicus Longus. A noble private palace, name unknown, faces the street on the north side. First to appear was the peristyle, with rows of columns made of bricks, coated with painted stucco, in the Pompeian fashion. Several apartments open on the peristyle, the most conspicuous of them being the lararium or family chapel. The pavement is inlaid with the rarest marbles in graceful designs; the side walls painted with arabesques; the back wall above the altar has a fresco with life-sized figures, representing the Olympian Jupiter and veiled figures sacrificing to him. The works of art and various antiquities discovered within the palace make already a valuable collection. There is a lovely hermaphrodite lying on the bed under the influence of a dream. The attitude of the statue recalls to mind the Borghese hermaphrodite, which was presented to Cardinal Scipione by the monks of S. M. Della Vittoria. He thought so much of the gift that he afterward built, at his own cost, the façade of their church. The Costanzi hermaphrodite is in a perfect condition; one hand and one foot are missing, because, having been restored *ab antiquo*, the rust and oxidation of the iron joinings made them split. The head is as finely worked as a cameo. The statue was found carefully concealed between two walls, protected by a roof of stones, and lying like a corpse in his coffin. It is now exhibited at No. 15 Via di S. Basilio, and will be shortly placed in the vestibule of Signor Costanzi's new palace, by S. M. Maggiore. The frescoes of the lararium have been presented to the town and placed in the Capitoline gallery of pictures, together with a tombstone of some servants of the Emperor Commodus. Later on, and in the same place, the following monuments were discovered: Statue of a youth carrying a *hydria* on the shoulder; statue of a boy eating grapes; bust of a female (part of the head missing), with a peacock on the plinth; bust of Ariadne, two columns of breccia corallina, coins, cameos, lamps, pottery, water-pipes, brick stamps, etc. — *The Athenæum.*

Imperishable Water-Colors. — A new and important discovery is asserted to have been made by M. Mery, a Frenchman, which, if it prove to be true, will be valuable to the painting arts and trades. He has been experimenting a great many years, and he claims now to have hit upon the means of making and applying imperishable water-colors. He does not explain what he uses as a vehicle for his pigments, but it is something, which, while it will mix with water, is not soluble in it. Whatever it is, it renders the colors unalterable, and, as it becomes after a time as hard as cement or stone, they may be said to be indestructible. It can be applied to any surface suitable for ordinary oil or water painting, such as wood, paper, glass, stone, canvas, etc., and can be prepared so as to dry in a few minutes or remain moist for an indefinite length of time. It is suggested that possibly M. Mery has rediscovered the long lost art of encaustic painting, which is supposed to have been applied and fixed by means of heat. It seems almost incredible that a paint can be applied by means of water, and yet not be affected by it afterward, but our authority is excellent for saying that such is really the case. — *Exchange.*

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BOSTON, MAY 17, 1879.

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WE wish to remind our readers, especially our younger professional readers, of the appeal made lately by the Boston Chapter of the Institute for drawings illustrating the old architecture of New England, especially that of the colonial time. The immediate offer of prizes to draughtsmen by the Chapter is necessarily a stimulus of but limited range; we should be glad to see a more general interest in the subject grow up, for it is an important subject. Not only is there much that is interesting, both of design and of detail, in the colonial work, much that is serviceable for purposes of study, and artistically pleasing, but there are many questions of interest concerning the history and sequence of our architecture which can be solved only by careful examination of our old buildings, with comparison of dates and localities, — a mode of study which has, as far as this subject is concerned, been almost absolutely neglected. To mention one, there is the question of the old gambrel roof, very common in the Northern States a century ago. When was it first used, and when given up? Where did it come from? It may be said roughly to have been used as early as the seventeenth century, and to have been given up after the Revolution. But was it an indigenous construction which grew up out of practical wants among our Northern farmers? or was it an importation, and if so, from whom? The obvious suggestion that it is substantially the French mansard roof, and must have been copied after it, does not seem to be borne out by evidence. It has been suggested that it was copied into New England from the buildings of the Dutch settlers in New York. If this should prove to be the case, where did the Dutch settlers first find it? Its prototype is not to be seen, we believe, among the old houses of Holland. These questions might be answered by careful comparison of a good number of the older examples, if people could be found to make accurate record of them, with attention to their dates. Many other questions which would arise could in like manner be solved, and much interesting information be got together, if there were any one to collect examples with the necessary precision.

THERE is still much of the old work left, but every year more and more of it is pulled away to make room for more pretentious, but commonly inferior work, or falls into ruin from neglect and decay. A great many handsome old houses survive in the quieter and older New England country towns; for in the colonial days the magnates did not crowd into the largest cities as leading men do now, nor was the preëminence of a few towns fixed as it is now. In some regions of New York there still remain the quaint farm-houses of the early Dutch settlers. In the older Southern States, where there has been less disposition than at the North to replace the work of early days, and, we believe, especially in Virginia, a great many fine old manors, and some churches and civic buildings, still tell of colonial grandeur. Architects, draughtsmen, or amateurs who will take the trouble may do good service if they will lend a hand in keeping this inheritance of good work from being forgotten. The young men in the profession will find their especial account in the careful study of what is often superior in character and refinement of detail to contemporary work. But many valuable records may be preserved without the help of professional skill. Any one who has the patience to be thorough, and skill enough — it does not need a great deal — to take accurate measures and to profile mouldings with precision, can make a useful record. If artistic sense and professional knowledge are present it is a great gain, but the essential thing is intelligent exactitude. There is already, to be sure, a great amount of picturesque representation. Books and periodicals contain an immense quantity of artists' sketches of old buildings. These have their value as suggestions; but for history or criticism, still more for instruction, they are worthless.

IN answer to the circular which we mentioned a fortnight ago, and to a subsequent call, a preliminary meeting for the founding of a Society for Archæological Research was held in Boston last Saturday. The forty persons who attended showed that there is a serious interest in the object for which the society is to be formed, while the remarks of the chairman and others of the speakers indicated that when definite work was undertaken in the way of exploration, the necessary funds would probably be raised without difficulty. There was more or less discussion of the proper field for the work of such a society, the prevailing opinion being that while the whole range of American and foreign archæology claimed its attention, in view of the provision already made by other institutions — the Smithsonian Institution and the Peabody Museum, for instance — for the study of American antiquities, it was well to turn the first attention of the society to some of the important and thus far neglected fields of exploration in classic archæology. A committee was appointed to prepare a scheme of organization for the society, and report at a second meeting, to be held to-day. The objects of this association are of special interest to architects, and it is to be hoped that they will take an active part in its work. An archæological society without architects is like a legislature without lawyers.

IN the discussions that we have heard of late concerning various ways of improving the lodgement of the poor in cities, the improvements which have been made in Glasgow during the last dozen years have often been spoken of. These improvements are not of a kind which we are likely to see copied in our own cities; but they are interesting on account of the shrewdness with which they were managed, and for their striking contrast to the lordly and extravagant alterations that went on conspicuously in Paris at about the same time. Sir James Watson, who for six years was chairman of the committee to whom the corporation of Glasgow intrusted the management of the improvements, read last month a paper on them, before the Royal Institute of British Architects, which we find reported in the English building journals. Glasgow is a very old city, going back to the dark ages, and parts of its cathedral dating from the twelfth century. Like all mediæval towns, it was densely built, and until 1866, when the improvement act was passed, the lines of the mediæval streets in the older parts of the town appear not to have been disturbed, though the buildings had been replaced, and in the unexampled growth of the population had become crowded beyond the example of any European city. It was a maze of narrow and filthy streets, lanes, and blind alleys or "closes," often not two yards wide, lined with tall old decaying houses, in which swarmed a population that outdid even that of the New York tenement houses, there being sometimes, it is said, as many as a thousand to the acre. This condition of things was so intolerable that in 1866 the corporation and its architect devised a plan for redeeming a large tract, amounting to eighty-eight acres, — the whole of the ancient town, in fact, — and laying it out anew. They got authority from Parliament to purchase the property and tear down the buildings, and they redistributed the whole among no less than forty-five new or enlarged streets. To meet the cost of this the citizens were persuaded to submit to a tax on rental of six pence in the pound for five years, and two pence for ten years longer; but the tax, proving very unpopular, was reduced to four pence after the first year. The ground was purchased from time to time and cleared, and then, the intended streets being laid out and sewered, was resold under proper restrictions, to be built upon by the new owners. So well was the whole thing managed that the raising of about three hundred and fifty thousand pounds by taxation furnished sufficient capital for all the improvements,

including the purchase of land to the amount of nearly a million and three quarters sterling; and Sir James Watson estimates the net cost to the city of the improvement, including suits lost and interest on the cost of land idle during the transfer, as well as all expenses of management, at about one hundred and eighty thousand pounds.

The way in which the thing was done does credit to the cleverness of the shrewd Scotsmen who controlled it, as well as to the citizens who supported it. The corporation did not rush into the market at once as a wholesale buyer; but, acting through "a judicious person," it approached the owners singly and privately, buying at first such land as they were readiest to sell, and so getting possession during the first year of only about fifty thousand pounds' worth of land and buildings, but at very moderate rates. Whether on account of public opinion, or the shrewd dealing of the committee, there seems to have been little blackmailing of the city by putting fancy prices on the land which was to be taken. This was partly due to a clever device. It was ruled that no striking improvement, such as should enhance the value of land at any point, should be undertaken until all the land affected by it had been purchased. The purchase and the alterations went on slowly. For two years nothing was done but to put the buildings secured into repair, keeping them occupied, and to open up here and there access for light and air. Then the work of removing the old houses began, and went on as the land was gradually bought in, the worst and most unwholesome being destroyed first. Care was taken not to evict the tenants faster than room could be found for them elsewhere. At first two large plots of ground in the neighborhood were purchased, graded, and sewered, at a cost of about eighty thousand pounds, and parcelled out among builders who would put up houses to be let to workmen at moderate rates. This was accomplished with a profit of fifteen thousand pounds. But the knowledge that the inhabitants of the rookeries would be dispossessed quickly set owners elsewhere to building houses and tenements for them as fast as they were wanted, and even faster. The ground thus reclaimed from the centre of the city naturally brought too high a price to allow of using it for dwellings of the poorer classes, and as the wider streets were opened through it they were built up with shops and warehouses, or with houses for the middle class, while, as usually happens, the poorer classes found their homes in the outskirts. In the interest of these classes, ordinances have been passed requiring that all plans for buildings shall be under the supervision of appointed officers, and fixing definite restrictions upon those used for dwellings and tenement houses, — such as that no room shall be used as a bed-chamber unless it looks out upon a street or other open space three fourths as wide as the height of the wall of the building, and that in the new streets no house shall be higher than the width of its street; all rooms must be at least ten feet high, and when a single room is let as a tenement it must contain not less than 700 cubic feet of air space, or in a new building, 900; if a tenement includes two rooms they must together contain 1,200 cubic feet, or in a new building 1,500; if three rooms, 1,800 feet, in a new building, 2,000. It is also ordered that in sleeping-rooms there must be for every occupant eight years old or upward 300 feet of space, or for every child of less than eight years 150 feet. Thus, although the poor in Glasgow, as in other cities, have been driven away from the centre, special care has been taken to eject them with as little hardship as possible, and that their new homes shall be a great improvement on the old.

The trial of the eight persons sweepingly indicted last fall, for conspiracy to defraud the Government in the matter of the stone-work of the Chicago Custom-House, was begun last week at Chicago. These persons, it will be remembered, were Messrs. Mueller, the contractor, and Mills, his clerk; the two successive Supervising Architects, Messrs. Potter and Hill; the two superintendents, Burling and Prussing; and the foremen, Reed and Wheaton. The counsel for Messrs. Mueller, Mills, and Reed began with an effort to stave off proceedings by moving to quash the indictment. This was opposed by Messrs. Potter and Hill, who wished that the trial should proceed without delay. Mr. Potter's counsel, however, moved for a bill of particulars, on the ground that the indictment charged no definite acts upon his client. The counsel who moved to quash the indictment remarked with curious indifference, it would seem, to the effect of his declaration, that some of the defendants were opposed to any dilatory motions, but that "the gentlemen he represented had no such queer notions of delicacy." The court, after taking the motions into advisement, decided against both, saying that the indictment, though not perfect, would stand, and that it was definite enough to show the defendants what was the charge against them, and the court what was the penalty to be inflicted in case of conviction. These points being settled, and the jury empanelled, the case is fairly under way. It may well be a long case, the defendants being many and not particularly harmonious, — so little so, in fact, that Mr. Potter's counsel made a point of the persistent antagonism between his client and Mr. Mueller, asserting that it would have been as reasonable to indict Grant and Lee for conspiracy. The array of documents to which the various counsel may betake themselves is nothing less than appalling to those who have tried to follow the controversies over the Custom-House in their earlier stages. It will also be a trial of great interest to the public if it is not prolonged beyond endurance. For the sake both of the public and of the defendants we may hope that the real issues will not be obscured by merely technical fence. The public will wish not only to know that its officers have not been tripped up in the trial, but to feel sure that they have done no wrong. Those who care anything for the defendants will take less comfort in knowing that the prosecuting officers have failed to maintain the specific allegations of an indictment, which under a charge of conspiracy is always a difficult thing to do, than in a clear indication that there is no fault to be found; and will look complacently on any queer notions of delicacy that tend to let in a full and vindicating light on their conduct.

At the beginning of the present session of Congress the Boston Society of Civil Engineers submitted to both houses a memorial, praying for certain enactments to carry out the recommendations of the House Committee on Coinage, Weights and Measures of the last Congress. These enactments were that after July 1, 1881, the fifteen gramme rate should be substituted for the half ounce in the post-offices, all the offices being furnished with metric balances, for which an appropriation of fifty thousand dollars should be made; and that from the same date metric weights and measures should be made obligatory in the transactions of the custom-houses of the United States. These recommendations are probably as well-judged as any that can be offered for the acceleration of a change which it is plain to see will come in no long time; but we can hardly hope that our rulers will at present find time to discuss them or to order them. The practical adoption of a new standard of weights and measures is not to be expected till the Government orders it, and it is to government undertakings and business that we may look to familiarize people with its working: but this we may not hope to see till the people themselves are pretty well prepared for the change, for it is not a matter in which we can expect Congressmen to go in advance, whatever may be the recommendations of their better informed committees. The advocates of the change must therefore still rest their hopes upon public instruction, which has already made provision for the subject in the schools of many cities and towns, and to the persuasions of those classes of men who are most interested in the movement. These do not always move as fast as we might expect, for we find that the Association of Civil Engineers of the Northwest has only at its latest meeting, held last week, received the report of the committee which it appointed three years ago to consider the introduction of the metric system. The judgment of the committee, set forth in their report, is wise, we think. They believe that the change must come, and that when it comes it will be worth more than its cost. But they "do not see that it can be forced by legislation upon an unwilling or even an indifferent and uninformed people." They therefore urge the value of school instruction in the metric system, quoting from a hopeful letter of the Chicago Superintendent of Schools: "We intend to have all our grammar-school pupils get a good knowledge of the metric system; for by the time they become men and women, no other system of weights and measures will be used in this country." The report also recommends, inasmuch as the use of the metric system by the Government is the best means of habituating the people to it in practice, that the association shall join with the Boston club in its memorial to Congress, and would add the recommendation that after the date fixed in it all material bought, or work done, by the Government shall be measured by metric standards, except in case of work begun or contracted for before that date.

THE OPEN FIRE-PLACE. XII.

EXPERIMENTS WITH THE "FIRE-PLACE HEATER."

THE first of our experiments with the "Fire-Place Heater" were made on the 1st of January, 1879, when the external air stood at 0° C. At the beginning of the experiment, the thermometer in the room stood at 11.25° C.; four kilograms of dry pine wood were burned. At the end of half an hour the mercury had risen to 15.50° C., and from thence it began gradually to fall as the fire went out, until at the end of an hour it stood at 15°. The fresh air was conducted to the back of the heater through a brick flue opening to the outer air under the window. It entered the room warmed through two openings just under the mantel, right and left, over the heater.

The following table gives the result of the test: —

TABLE III.

Remarks.	Time.	Temperature of Room.	Temperature of Air entering through Left-hand Register.	Temperature of Air entering through Right-hand Register.	Velocity of Current entering through Left-hand Register, in Meters, per Minute.	Velocity of Current entering through Right-hand Register, in Meters, per Minute.	Cubic Meters of Air entering through Left-hand Register, per Minute.	Cubic Meters of Air entering through Right-hand Register, per Minute.	Equivalent in Cubic Meters raised 1° (Left-hand Register).	Equivalent in Cubic Meters raised 1° (Right-hand Register).
	1	2	3	4	5	6	7	8	9	10
Fire lighted; 2 kilograms on.	1.00	11.25°	4°	2°	72	90	.97	1.17	3.88	2.34
	5	12	10	8	99	84	1.34	1.09	13.40	8.72
	10	13	20	9	100	96	1.35	1.25	27.00	11.25
Third kilogram put on.	15	13.50	30	10	94	96	1.27	1.25	38.10	12.50
	20	14.50	31	13	96	96	1.30	1.25	40.30	16.20
	25	15	32	13	100	95	1.35	1.25	43.20	16.20
	30	15.50	32	14	102	96	1.35	1.25	43.50	17.50
	35	15	32	14	96	96	1.30	1.25	41.60	17.50
	40	15	32	14	96	96	1.30	1.25	41.60	17.50
Fourth kilogram put on.	45	15	32	15	96	96	1.30	1.25	41.60	18.70
	50	15	32	14	90	90	1.20	1.17	38.70	16.30
	55	15	31	10	90	90	1.20	1.17	37.50	11.70
	2.00	15	30	8	85	90	1.17	1.17	35.10	9.35
							16.41	15.77	445.48	175.77
							5	5	5	5
							82.05	78.85	2,229.90	878.85

The table shows us that three kilograms of wood burned in this fire-place raised the temperature of the room 4½° C., or over four times as much as the same amount burned in the ordinary fire-place accomplished.

The heat saved from the back of the fire-place was sufficient to raise the temperature of 2,229.90 + 878.85 = 3,108.75 cubic meters of air 1° C. Or, since one cubic meter of air weighs 1.3 kilograms, 3,109 cubic meters would weigh 4,041.7 kilograms, and the specific heat of air being 0.24, we have 4,041.7 × 0.24 = 970 heat units saved. Add about $\frac{1}{30}$ for heat still remaining in the back and sides of the fire-place at the end of the experiment, and we have a total of about 1,000 units of heat saved by this apparatus in every 4 kilograms of wood.

If we assume as before that 1 kilogram of our dry wood yielded 3,590 units of heat in the process of combustion, 4 kilograms would have yielded 14,360 units. Therefore, our 1,000 units saved would be equivalent to 7 per cent of the whole amount of heat possible to be obtained from the fuel. Add 6 per cent for that due to direct radiation, and we have 13 per cent utilized, or over twice as much as was obtained from the ordinary fire-place. With coal the amount of heat utilized would be 7 + 13 = 20 per cent, or the same as is obtained from the apparatus of Fondet, according to the calculations of General Morin. If, in connection with this heater, the double flue of Belmas or Galton is used, as is recommended by the manufacturers, the saving may be 5 or 10 per cent greater, making a total of 25 or 30 per cent. In order that the conditions under which this heater was tested might be as nearly as possible the same as those attending the test made on the old fire-place recorded in Table I., another experiment was made later in the season, when the thermometer of the external air stood at 13° C. The air of the room was raised by the combustion of 3 kilograms of wood from 17° to 21°, or again, 4° C., and in all the experiments the temperature in all parts of the room was very nearly the same. The entrance of cold currents through door and window cracks was almost entirely avoided. The movement in the air was perceptible, yet the ventilation was perfect, and no disagreeable odor was perceptible for any length of time, even after the room had been filled with mechanics and laborers. We see by columns 7 and 8 that there passed into the room a ventilating current of warm air at the rate of over a cubic meter a minute from each of the two registers, making together in the hour over 160 cubic meters. This air was at no time heated above 32° C., and averaged about 22°, — a mild and pleasant temperature.

A test was also made at the top of the chimney to ascertain the temperature of the air as it issued from the mouth. The thermometer rose as high as 82°, and then began to fall. By Table I. it will be seen that the temperature with the old fire-place rose to 84° and 90°. The difference by this test was, therefore, apparently unimportant, though a careful measurement, with the anemometer and thermometer, of the heat units thrown out would have shown a saving corresponding with that detected below.



Fig. 113.

Fig. 113 gives a sectional cut of another fire-place manufactured by the same company. This apparatus consists of a double stove, the inner one being used to hold the fuel and carry off the products of combustion, and the space between the inner and the outer serving to warm the fresh air to be introduced into the room. If a blower be used over the fire, the open fire-place is converted into a close stove or furnace, with fresh-air flues, etc. It is unquestionably one of the most satisfactory stoves known in this country, designed for combining health with economy.

THE DIMMICK HEATER.

We now have manufactured in this country another excellent ventilating fire-place, called the Dimmick Heater, of which Figs. 114 and 115 give perspective view and vertical section.

The principle of this heater is the same as in the apparatus represented by Figs. 76 and 77. It has, however, this advantage over

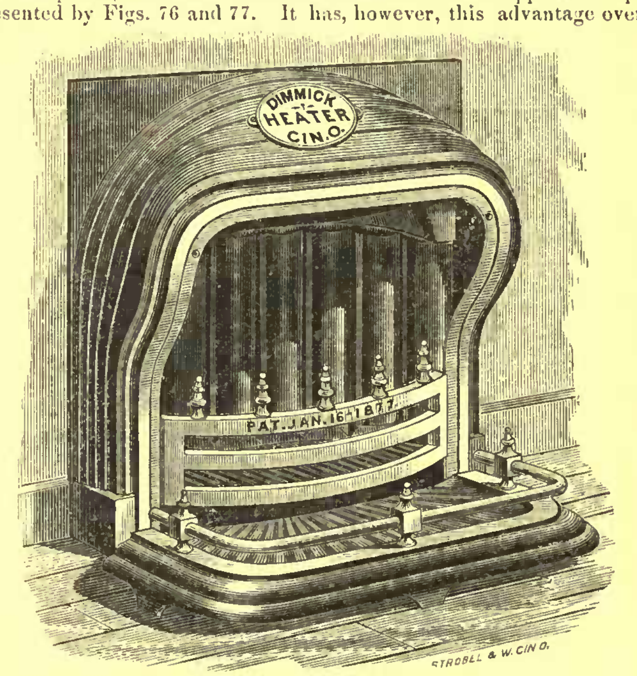


Fig. 114.

the latter, that the upright fresh-air tubes are joined together so as to form an air-tight fire-back, and enter a common hot-air chamber directly over the flame, having its lower side inclined at an angle with the back so as to reflect the heat into the room and throw the flame forward. This arrangement of the tubes and hot-air box gives the fire-place a more desirable section for radiating heat. As for the artistic effect of the exterior, none of the ventilating fire-places heretofore represented have much to claim, and in the present case it is possible to conceive of a form more pleasing than that represented in our cut. But a slight modification in the treatment of the hood would probably be sufficient to remove all objection on the score of appearance.

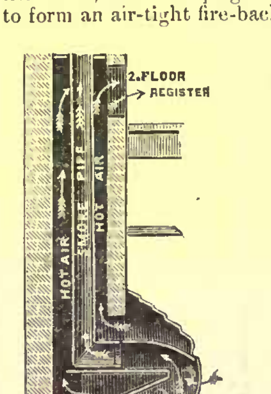


Fig. 115.

The fresh air, after having been heated in the tubes and box, is either conducted immediately into the room through registers opening under the mantel, or it rises in a double flue to the ceiling or to the rooms above, as shown in the section (Fig. 115).

In order to make an accurate test of the heating power of this fire-place, the writer had one placed in the room in which the previous experiments were made, and obtained the following results: —

EXPERIMENTS WITH THE DIMMICK HEATER.

The heater was set out in the room in front of the mantel, and the fresh air conducted through a brick flue direct from the outside

to the iron chamber under the upright tubes. The heated air entered the room through two openings perforated in the upper hot-air box over the fire already described, one at the right, having an area of 40 square centimeters, and one at the left, having an area of 104 square centimeters, and it was assumed that the volume of the fresh air given out by each was in proportion to the size of the opening, while the temperature was the same. The observations were made upon the right-hand opening. In order to protect the thermometer from the direct radiation of the iron, a brick flue was built around this opening and carried outwards horizontally about eight inches, and thence upwards about a foot, so that a thermometer hung in the upright portion of the flue would indicate with greater accuracy the temperature of the hot-air current and not be greatly influenced by radiation from any outward source.

At the time of the experiment recorded in the following table, from nine to eleven o'clock in the evening of April 11, 1879, the outside air stood at 4° C., and the air in the room at 16°. The anemometer was again tested in a current of air of known velocity, and found to be accurate. The allowance to be made for friction was recalculated, and found to agree with that made in the previous tests.

Three kilograms of dry pine wood were burned, and the amount of ventilation effected and heat saved by the apparatus is shown by the following: —

TABLE IV.

Time.	Temperature of Fresh Air entering the Room through the Register.	Velocity of the Air in Meters, per Minute.	Volume of Fresh Air in Cubic Meters, per Minute.		Difference between External Air and Air entering the Room through the Register.	Equivalent in Cubic Meters raised 1° Centigrade.		General Remarks.
1	2	3	4		5	6		7
8.50		16						
51								
52	12° C.	18	.072		8°	**0.6**		Fire lighted.
53	**14**	**18**	**.072**		**10**	**0.7**		
54	**16**	18	.072		**12**	**0.9**		
55	**18**	**25**	**.1**		**14**	**1.4**		
56	20	39	.136		16	2.17		
57	**25**	**40**	**.13**		**21**	**3**		
58	29	42	.168		25	4.2		
59	38	45	.180		31	6.1		
9.00	45	51	.204		51	10.4		Second kilogram put on.
1	**50**	**52**	**.20**		**46**	**11**		
2	**55**	**53**	**.20**		**51**	**12**		
3	**60**	**54**	**.21**		**56**	**13**		
4	**65**	**55**	**.22**		**61**	**14**		
5	70	57	.228		66	15.0		
6	77	57	.228		73	16.6		
7	83	57	.228		79	18.0		
8	88	**58**	**.23**		84	**19**		Third kilogram put on.
9	90	60	.240		86	20.6		
10	93	63	.254		91	22.9		
11	101	**64**	**.24**		97	**24**		
12	103	66	.264		99	26.1		
13	108	**70**	**.27**		104	**28**		
14	112	72	.288		108	31.1		Fire begins to decline.
15	116	**70**	**.27**		112	**30**		
16	118	**68**	**.26**		114	**30**		
17	120	66	.264		116	30.6		
18	121	63	.252		117	29.5		
19	120	**62**	**.25**		116	**28**		
20	119	**61**	**.24**		115	**27**		
21	118	**60**	**.24**		114	**27**		
22	116	60	.240		112	26.9		
23	**116**	**59**	**.23**		**112**	**26**		
24	115	**58**	**.22**		111	**25**		
25	112	57	.228		108	24.6		No more flame.
26	108	**56**	**.22**		104	**23**		
27	107	**55**	**.22**		103	**22**		
28	**105**	**54**	**.21**		**101**	**22**		
29	103	54	.216		99	21.4		
30	100	**53**	**.21**		96	**20**		
31	99	**52**	**.20**		95	**19**		
32	96	**51**	**.20**		92	**18**		
33	**93**	**50**	**.19**		**89**	**17**		
34	**91**	**49**	**.19**		**87**	**17**		
35	89	48	.192	9.27	85	16.3	801.1	Cinders turning black.
40	80	42	.168	.9	76	12.3	75	
45	70	**40**	**.15**	.8	66	**10**	55	No more sparks visible; cinders all black.
50	**65**	**37**	**.14**	.7	**61**	**8**	45	
55	57	**34**	**.13**	.6	53	**7**	40	
10.00	**50**	**31**	**.12**	.6	**46**	**5**	30	
5	**45**	**28**	**.11**	.5	**41**	**4**	22	
10	40	25	.100	.5	36	3.6	20	
15	**38**	**25**	**.10**	.5	**34**	**2**	15	
20	35	**25**	**.09**	.4	31	**2**	10	
25	**33**	**24**	**.08**	.4	**29**	**2**	10	
30	**31**	**23**	**.07**	.3	**27**	**2**	10	
35	**29**	**23**	**.06**	.3	**25**	**2**	10	
40	**27**	**20**	**.05**	.2	**23**	**1**	8	
45	**25**	**20**	**.05**	.2	**21**	**1**	7	
50	**23**	**20**	**.05**	.2	**19**	**1**	6	
							5	
							4	
							3	
							2	
							1	
							0.9	
				16.4			1,180	

NOTE. — Results obtained by calculation are indicated in heavy figures.

This table shows us (column 7) that the heat saved from the back of the fire-place and issuing with the air through the right-hand opening of 40 square centimeters area was sufficient to raise the temperature of 1,180 cubic meters of air 1° C. The other opening, having an area of 104 square centimeters, must therefore have given out heat sufficient to raise $1{,}180 \times \frac{104}{40} = 3{,}068$ cubic meters of air 1° C., the two making a total of $3{,}068 + 1{,}180 = 4{,}248$ cubic meters. Since, as before, 1 cubic meter of air weighs 1.3 kilograms, and the specific heat of air is 0.24, we have $4{,}248 \times 1.3 \times 0.24 = 1{,}325$ heat units saved by this apparatus in every 3 kilograms of wood.

Assuming that the 3 kilograms of wood here used yielded 10,770 heat units in the process of combustion, our 1,325 units saved would be equivalent to $\frac{1325}{10770} = 12$ per cent of the whole. Add 6 per cent for that due to direct radiation, and we have 18 per cent for the total amount of heat realized from the fuel, or just three times as much as was obtained from the ordinary fire-place. With coal the amount of heat utilized would be $12 + 13 = 25$ per cent, or 5 per cent more than is obtained from the apparatus of Fondet, according to the calculations of General Morin. If, again, in connection with the Dimmick Heater, we use the upright double flue as shown in the sectional cut, the heat realized is increased 5 or 10 per cent, making a total of 30 or 35 per cent. It therefore appears from these experiments that the calorific power of the Dimmick Heater is somewhat greater than that of the "Fire-Place Heater." But, whereas the latter threw into the room during the combustion of 4 kilograms of wood, as shown by columns 7 and 8 of Table III., $82.05 + 78.85 = 160.90 + (\frac{1}{20} \times 160.9) = 169$ cubic meters of air heated on the average to a mild temperature of 22° C., and at no time exceeding 32° C., the Dimmick Heater supplied only $16.4 + (\frac{1}{20} \times 16.4) = 17$ cubic meters through the right-hand opening, and $17 \times \frac{104}{40} = 44$ cubic meters through the left-hand opening, or a total of 61 cubic meters during the combustion of 3 kilograms of wood. Or for 4 kilograms $61 + \frac{1}{3}(61) = 80$ cubic meters heated during 20 minutes of the time up to 100° C., or the boiling point of water, and at one time as high as 121° C. By using a fire-clay back in front of the cast-iron tubes, and by either increasing the size of the fresh-air passages or else allowing the fresh air to circulate behind the tubes as well as through them, the heater might be materially improved, and a still greater percentage of saving obtained. This improvement might be made in setting, without altering the castings. The cold air entrance pipe shown in Fig. 115 should be increased in size, and should relieve the air behind as well as under the upright pipes. It should be provided with a simple damper to diminish the supply of cold air at pleasure to correspond with the ventilation required or the amount of fuel burned. The air passing up behind would then serve not only to lower the temperature of the pipes themselves by extracting some of the heat which would otherwise pass off by absorption, into the brickwork, but also to diminish, by dilution, the heat of the air issuing from their tops, and improve the ventilation of the apartment by introducing into it a larger volume of air heated to a lower temperature. Even as it is, it ranks as one of the best and most powerful ventilating fire-places of its kind yet known to the public. It is advertised at from $40 to $50, with $10 extra for flue to carry heat to ceiling or to story above.[1]

THE ILLUSTRATIONS.

THREE PLANS FOR TENEMENT HOUSES RECENTLY SUBMITTED IN THE "PLUMBER'S" COMPETITION.

THE design by "Octagon" provides that the cellar, the basement in the rear, and all yards are to be paved with brick, set on edge in cement mortar on a bed of sand 6 inches thick. The floors over the cellar and first story are to be of 4-inch brick arches between iron beams; all other floors are to be supported by 9 inch by 11 inch spruce beams two feet apart from centres; flooring to be of 1½-inch pine planks. Risers of stairs to be of face brick; treads to be sandstone slabs 3½ inches thick, supported at one end by open-arched brick walls, at the other by angle iron riveted to a 10½-inch iron beam. Mantel shelves to consist of moulded sandstone slabs, supported by two sandstone corbels. Estimated cost, $14,200. Rents to range between $6 and $12 per month.

The design by "Seven per Cent" provides —

(1.) No dark rooms.

(2.) A water-closet for each tenement, well ventilated, and accessible privately.

(3.) Stairs "open to the air," as required by the conditions of the competition.

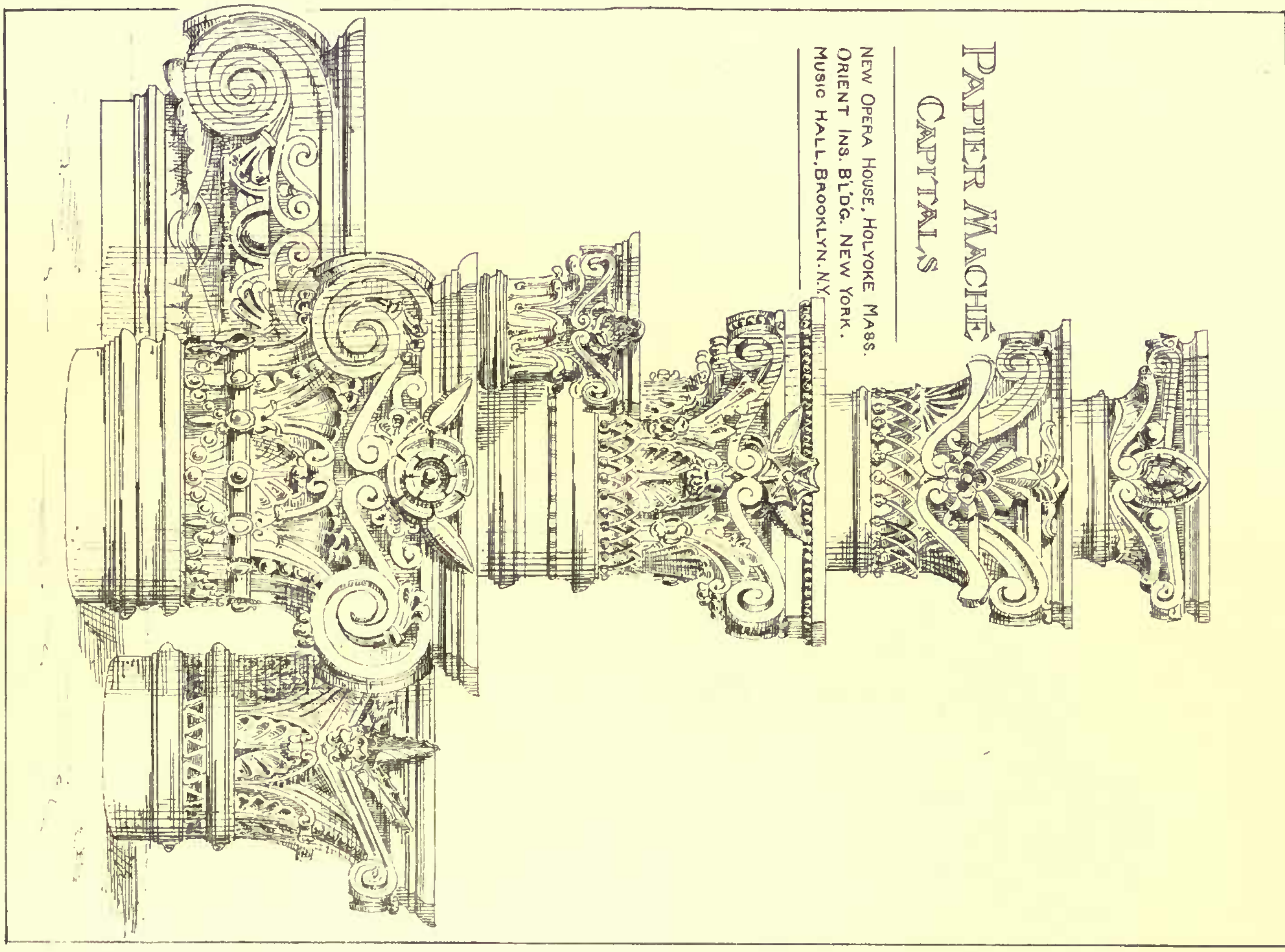
(4.) One good-sized central area for light and air in place of two small ones.

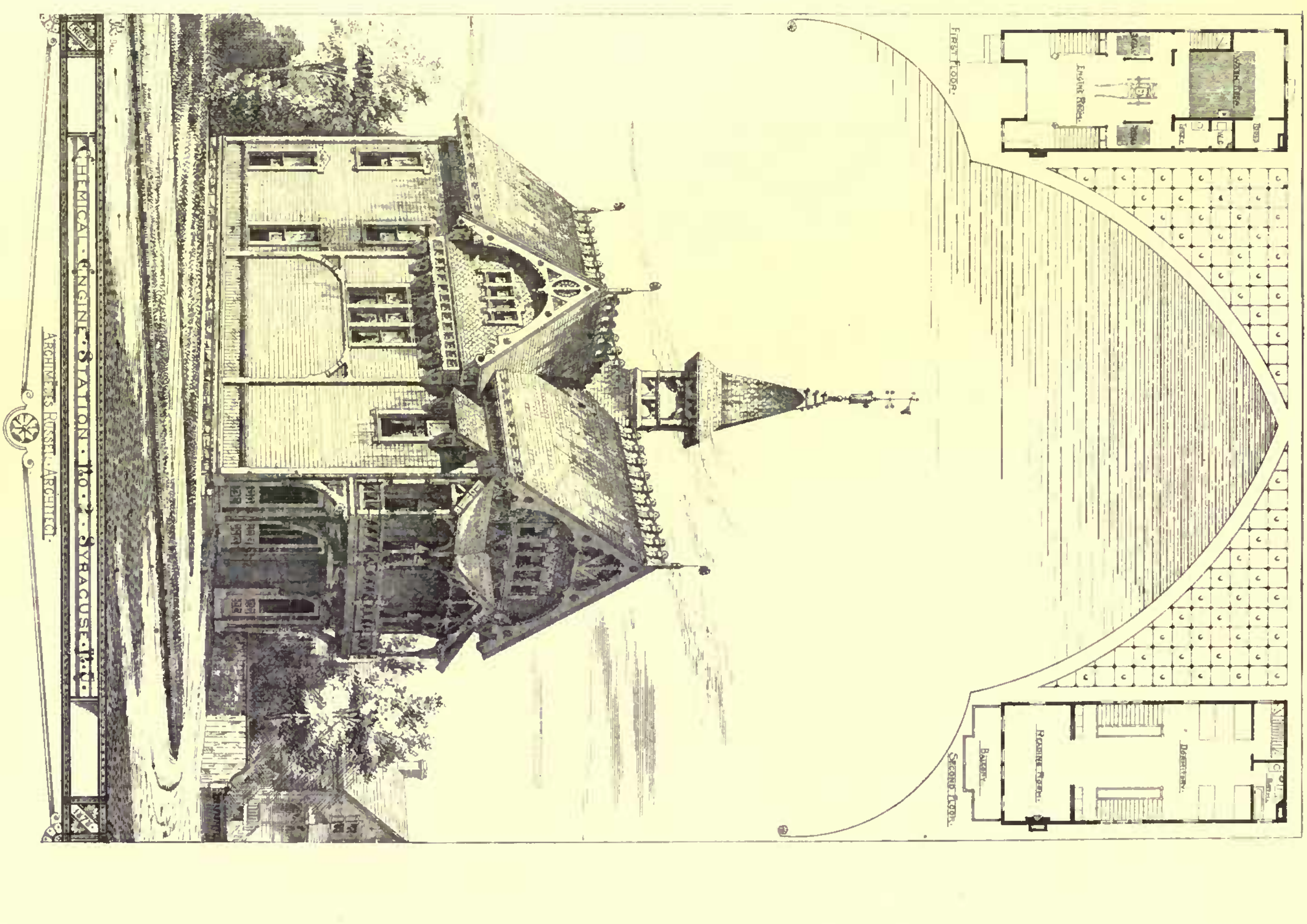
(5.) Tenements of one room, two, three, or four rooms, at the option of the tenant, each complete in itself in any case.

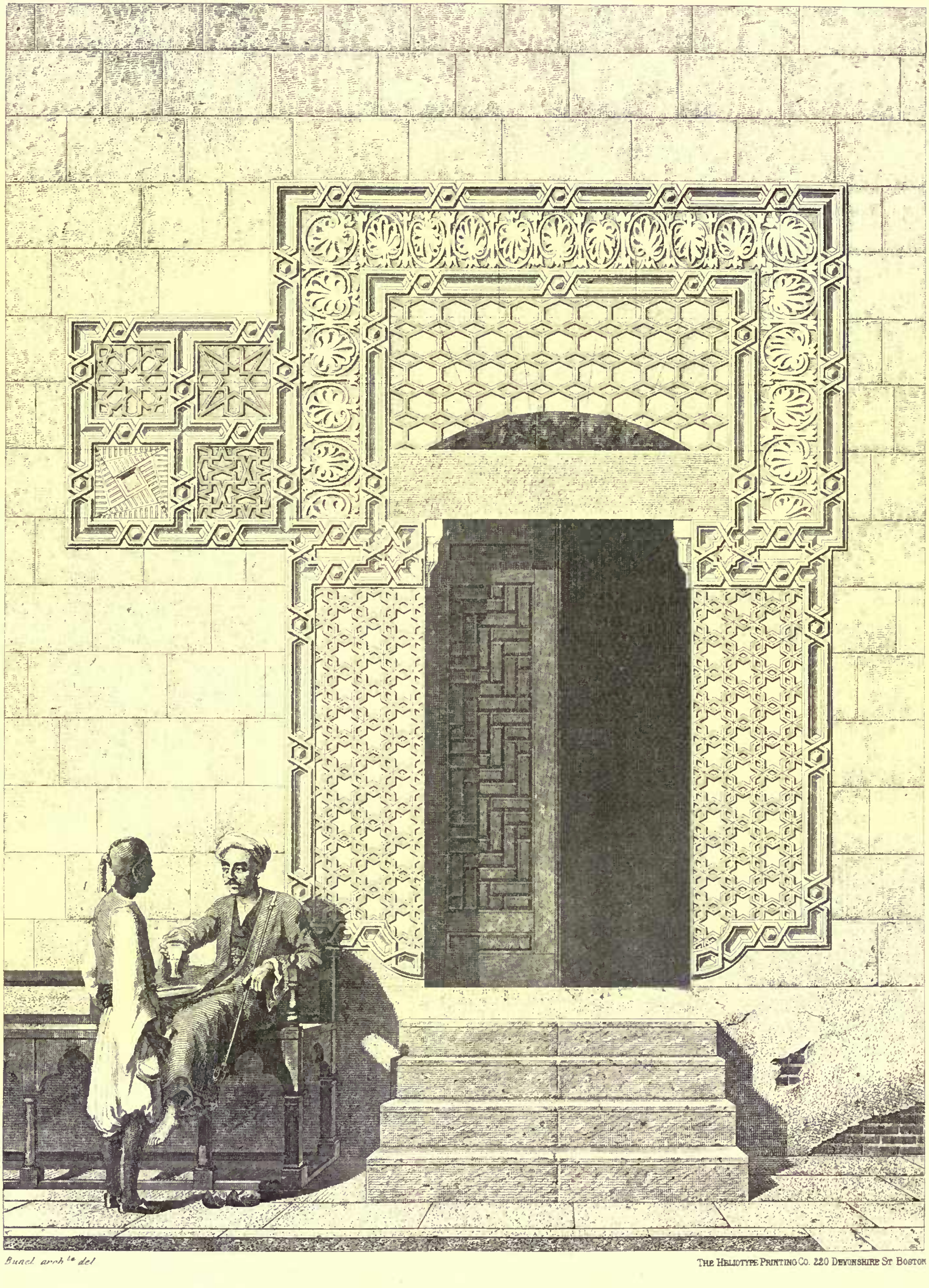
Gas lighting was suggested and estimated on account of "security against fire" (a main point in the conditions), though of course it is not essential to the plan.

The shell of the building as designed by "Prüfet Alles, das Beste behaltet" is intended to be of brick, while the interior partition walls would be of cast hollow cement blocks. The floors rest on beams eight inches square and two feet on centres, the spaces be-

[1] It can be had of the Dimmick Heater Company, Cincinnati, Ohio.


PAPIER MACHÉ CAPITALS
NEW OPERA HOUSE, HOLYOKE MASS.
ORIENT INS. B'L'DG. NEW YORK.
MUSIC HALL, BROOKLYN. N.Y.


CHEMICAL ENGINE STATION No 2 SYRACUSE
FIRST FLOOR
SECOND FLOOR

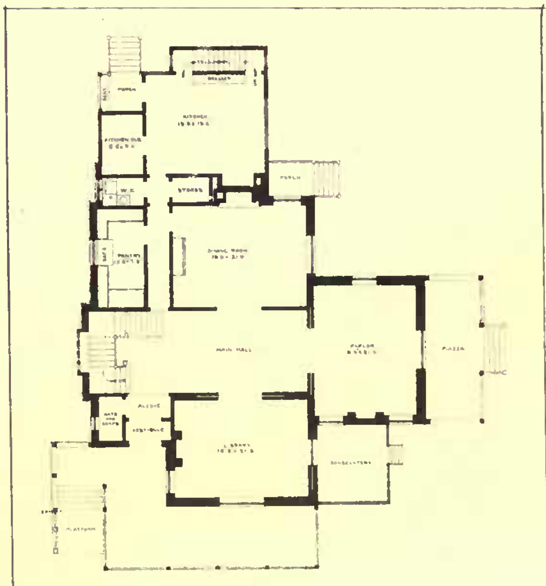


Bunel archte del

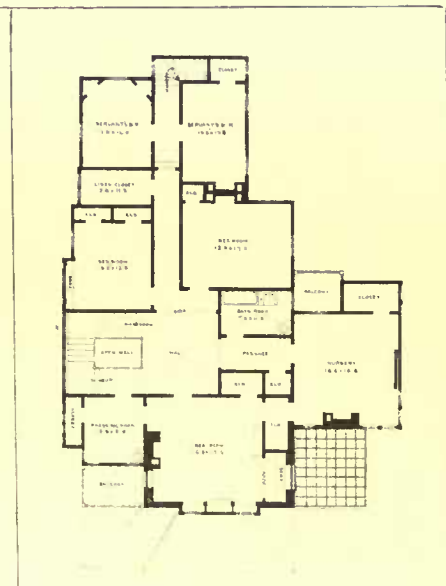
THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON

ARAB DOORWAY AT CAIRO.

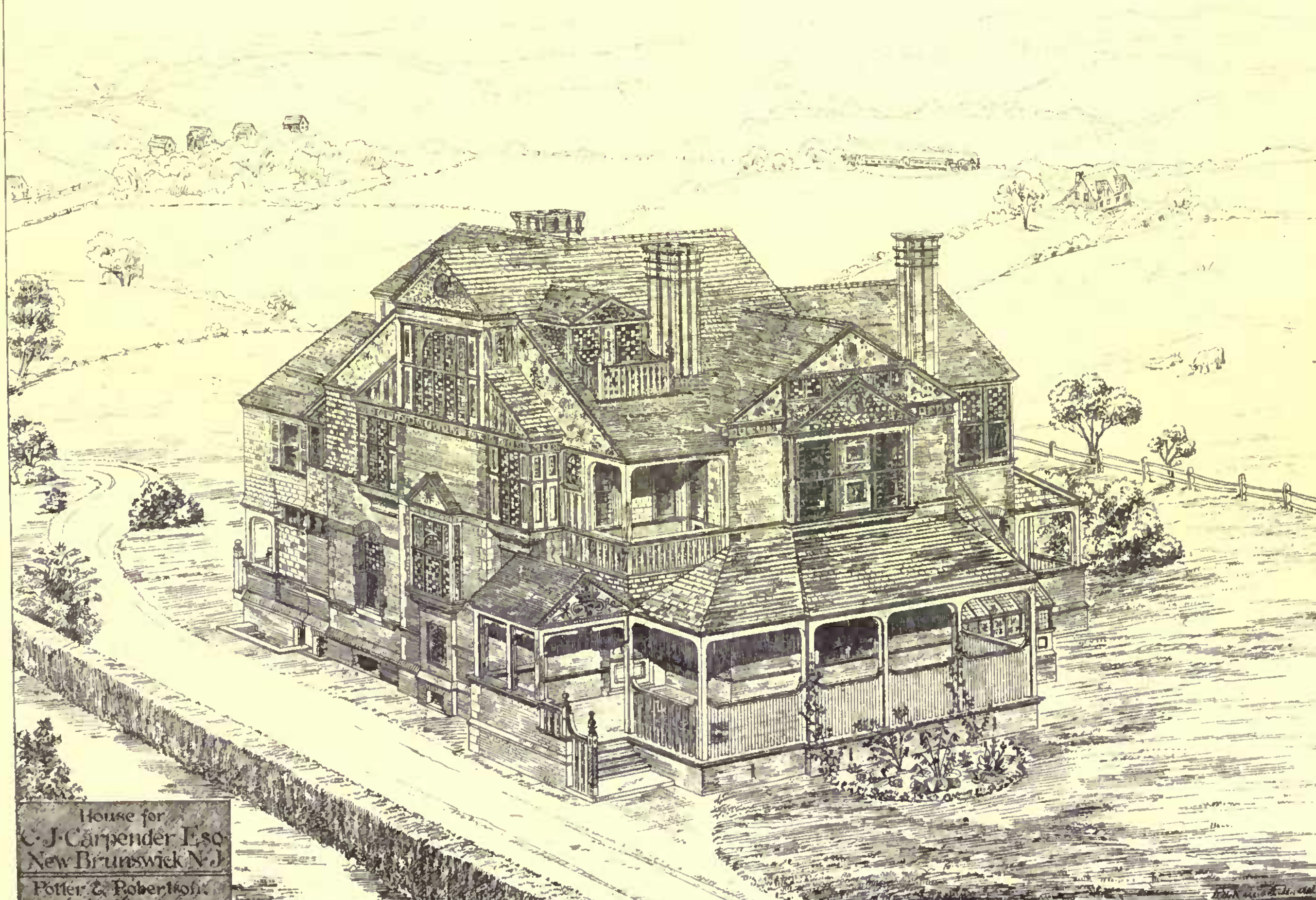
Revue Générale de l'Architecture et des Travaux Publics



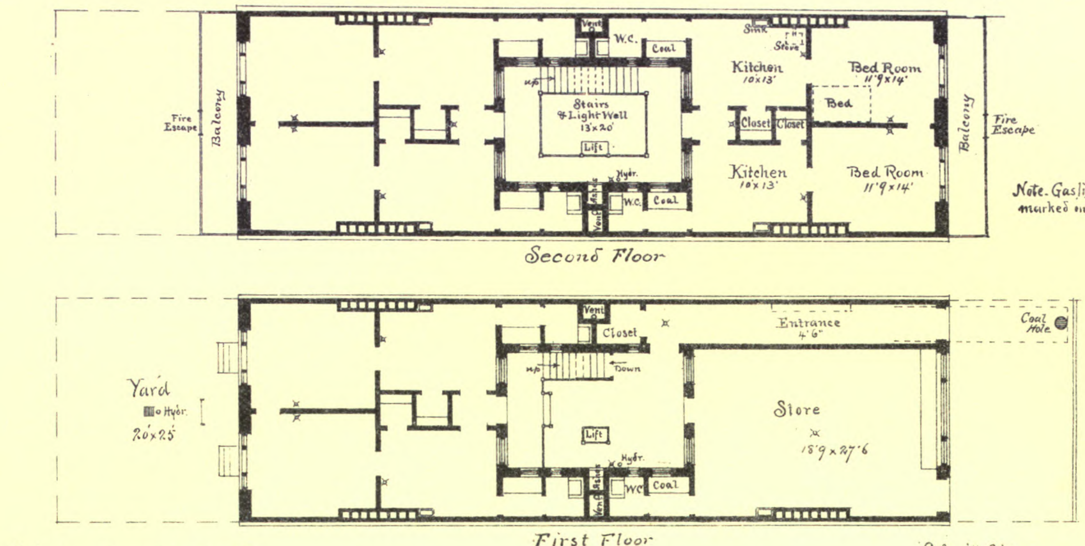
First Story Plan



Second Story Plan



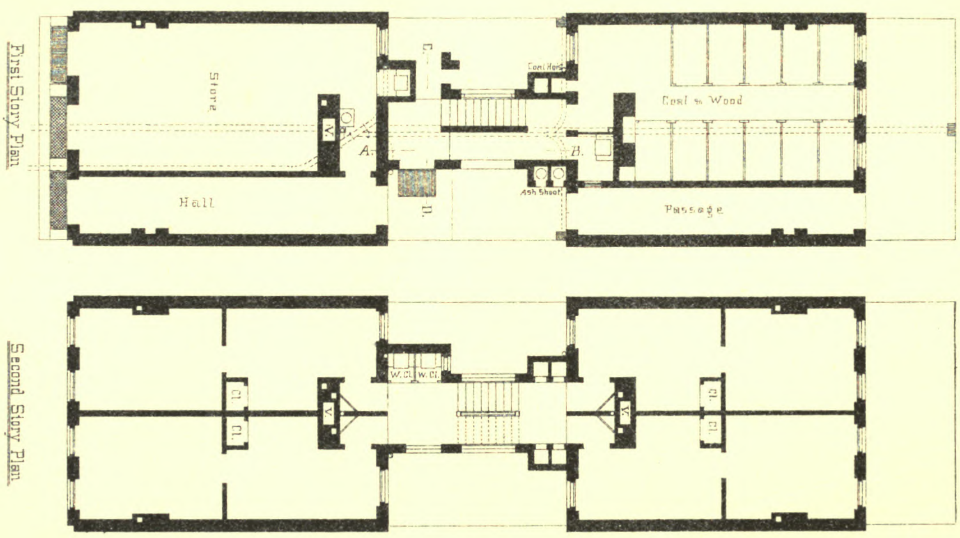
The Heliotype Printing Co. 220 Devonshire St. Boston



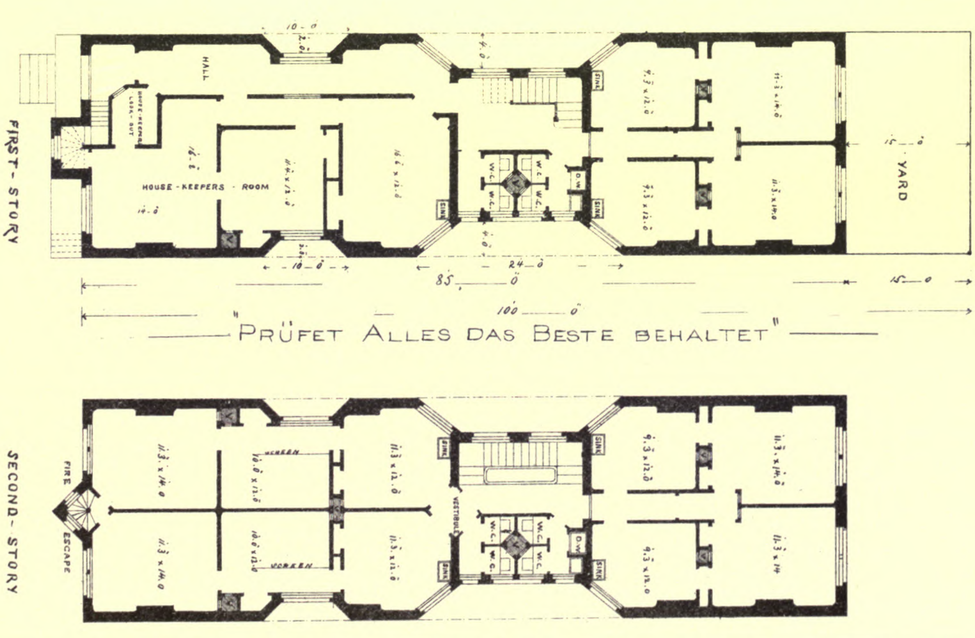
First Floor

Competition Design for Model Tenement House

Submitted by "Seven per Cent"



"Octagon"



"Prüfet Alles das Beste behaltet"

Plans for Tenement-Houses from the "Plumber's" Competition.

tween the beams being filled with hollow cement blocks and the beams themselves being protected by layers of cement. The staircases are fire-proof. For ventilation much reliance has been placed on the doors and windows, but besides these a ventilating cowl would be placed over the stairway, and special foul-air ducts, marked V on the second floor plan, would assist the ventilation when doors and windows must be kept shut. All the water-closets are grouped about a ventilating shaft. The chimney would be built of blocks of artificial stone which have two sets of flues, the innermost range of which would be air-ducts for supplying the rooms with fresh air drawn from the outside, which would enter already slightly warmed by contact with the smoke-flues. The soil-pipes of the water-closets are carried above the roof, and each trap is ventilated by a separate pipe. Each suite of rooms has a water-closet of its own. Each suite of rooms is provided with a vestibule door which would insure privacy. A dumb-waiter or lift is provided for raising fuel to the different rooms, or the Monday washing to the roof. The estimated cost is $12,850.

CHEMICAL ENGINE STATION NO. 2, SYRACUSE, N. Y. MR. ARCHIMEDES RUSSELL, ARCHITECT.

This building is the property of Fire Commissioner Hamilton S. White, and is maintained at his expense. The interior finish is of cherry. The principal object in the arrangement of this building has been that the engine may respond to the alarm with the least loss of time. Cost, $6,000.

PAPIER-MACHÉ CAPITALS IN THE OPERA HOUSE, HOLYOKE, MASS., IN THE ORIENT INSURANCE BUILDING, NEW YORK, AND IN THE MUSIC HALL, BROOKLYN, N. Y.

ARAB DOORWAY AT CAIRO, EGYPT.

This doorway, which is reproduced from the *Revue Générale de l'Architecture*, is the entrance to a private dwelling in the Coptic quarter of the city and is one of the most complete and interesting types of a style of decoration which is much employed by the Arabs. The carving, which is admirably worked, is executed in a free-working stone. The tympanum between the lintel and the discharging arch is decorated with light-colored tiles. The house to which it belongs is probably not older than the last century.

HOUSE FOR C. J. CARPENTER, ESQ., NEW BRUNSWICK, N. J. MESSRS. POTTER & ROBERTSON, ARCHITECTS, NEW YORK.

THE EXHIBITION OF CONTEMPORARY ART IN BOSTON.

II.

BEFORE turning to the landscapes we will begin where we left off in our last issue, and continue with the portraits and *genre* pictures. Mr. G. Fuller is both portrait painter and landscapist. His mellow Boy (328) is admirably painted, save the hands. His study for the Runaway Girl (394) is a clever and suggestive sketch, but his Boy and Calf (318) is an interesting picture. The poetic feeling is there; his repugnance to the commonplace is manifest both in its conception and in its execution; yet the handling is disagreeable, and the "values" false. It looks as though it were glazed with the yolk of an egg. If nature should suddenly appear to mankind as Mr. Fuller has portrayed her, we believe that no one would be more surprised than Mr. Fuller himself. This artist apparently tackles his subject with, as the French say, *un parti pris*. The same remark applies to Mr. Tilton (432). Should an apparition of Venice, decked as he has decked it, unexpectedly reveal itself to the dumbfounded Venetians, Mr. Tilton doubtless would shout with the multitude, "A miracle! A miracle!" Mr. J. Whistler's slight but well-toned sketch (374) suggests the crowded court-room, the irate arch-critic, the pugnacious artist, and volleys of uncomplimentary epithets. In short, it suggests the ever-memorable trial, Whistler *v.* Ruskin. Mr. Winslow Homer sends two pictures illustrative of negro life, Sunday Morning in Virginia (404) and A Visit from the Old Mistress (308). It is the fashion to admire this artist's studies of American life. So do we from a certain point of view. They will always be interesting, just as old prints, descriptive of the customs and costumes of the epoch, are interesting. They amuse us to-day, and if preserved, will amuse the archæologist of the future. But as works of art, ah, that is a very different thing. There is no attempt at composition. "Values" are totally ignored, and the drawing (note the old woman in No. 306, supposed to be sitting) is very dubious. Mr. Homer relies on a sagacious choice of incident, and therein is the secret of his success. Mr. Wyatt Eaton exhibits a picture of the Jules Breton type, Harvesters at Rest (370). His group is happily composed and suggestive of well-earned repose. The air is murky with misty heat, and the laborers gladly recline in the shade of the heaped-up grain. The flesh lacks suppleness in treatment, and there is too much sustained heat everywhere. The figures are painted, not sunburnt. Miss Elizabeth Bartol has just those qualities that Mr. Eaton lacks. Her Portrait of Three Boys (376) vibrates with light. It is an admirable sketch. If we may judge from the subject, treatment, and signature of No. 306, Roman Girls, by Tito Conti, this picture should have been hung in the Allston room with the European works. Though cleverly handled, it is allied to a class of vulgar productions, savoring of models and dissipation that has done more to demoralize art than all the heresies rampant in our community. To what degradation this sort of thing leads may be seen in Mr. Humphrey Moore's After the Ball (468), which has not even the merit of being clever. Puritans, by Mr. C. R. Grant (319), is a noteworthy picture. It is refined and artistic. We can best express what we think of it by saying that it has no cheap qualities. The grays are delightfully varied, and the pure colors adroitly broken. The only blemish in the picture, and that a slight one, is the puckering of the blue dress on the shoulder of the girl standing, a blemish that somewhat mars her symmetry, and which the artist would have avoided were he more conversant with the human form. In his own interests, and in those of art, we trust that he will devote his leisure hours to studies from the nude and artistic anatomy. From its celestial position it would be difficult to form a true appreciation of Mr. Charles S. Reinhart's Wanderer (419) without the aid of a powerful lens. Viewed with the naked eye from the regions below it looks as though it deserved a less cruel fate. We should scarcely judge from Mr. F. A. Bridgeman's Oriental Interior that he was one of the few American recipients of French honors; but such is the fact. Mr. Louis C. Tiffany's picture, No. 347, can boast a capital sky, but the "reaper" himself is not the work of a figure-painter. The only other *genre* paintings worthy of notice are two diminutive but clever pictures, Nos. 431 and 401, painted respectively by Mr. W. L. Metcalf and Mr. Gangengigl, — the latter probably a foreigner.

In an American exhibition landscape always predominates. Under the circumstances this is natural. Not that our life lacks picturesqueness, as many suppose, but because our art is yet in its swaddling-clothes. Critics are in error when they assert that America is the place *par excellence* for landscape. In point of fact the eastern portions of our land (and possibly the western) are pictorially inferior to Europe, to the Levant, or to the northern shores of Africa. The "values" in French, English, or Dutch landscape, and the grand anatomical forms of the Mediterranean provinces, are vastly superior to the same qualities in our own scenery. We make these comparisons merely to prove that our surroundings do not inevitably impel us to landscape. No more does our genius. A glance at the foreign room will convince any intelligent person that we are not superior in this department to our friends across the sea. It is true that our life is not peculiarly picturesque (though there are phases of it worthy the brush), but picturesqueness is not the greatest quality in art. In fact it is one of the humblest. We do not paint the figure, because as yet we do not know it. We have opportunities of rendering the human form in its noblest state, opportunities which we neglect because we cannot render it. Our choicest youths contest their Olympic games before our eyes, and we let the occasion slip. Some painters have tried it; but how? Simply from the picturesque point of view. We do not wish to say that one branch of a profession is more difficult than another. To do anything well is no easy task. By industry and observation a man can translate inanimate nature well, provided he has it in him. But no one can creditably render the human form without a course of profound study. When our schools are older, our teachers riper, and there is a craving felt by art patrons for the higher qualities in art, then doubtless we shall produce worthy figure-painters.

From the number and importance of his pictures exhibited, Mr. J. Foxcroft Cole occupies the foremost place among the landscapists. He is a straightforward, simple lover of the truth, and therefore his pictures are sympathetic to one who delights in nature. He is not masterful. His large picture, Sheep-Washing in Normandy (390), is his best, if we may except the more unpretending No. 338, Spring, Melrose, which almost seems the work of another hand. This varying of execution according to the subject is to Mr. Cole's credit. Receipt painting is poor stuff. How often, by the way, must connoisseurs be deceived, who rarely take experimental pictures into account — as if one artist never struck out in a new direction! Mr. Cole's Jersey Bull (No. 326) is well drawn, and in parts admirably painted, but as a whole is opaque and leaden, particularly the landscape. We think that he is seen to greater advantage in the hall (Pasturage in Normandy, 202) than in the exhibition rooms. Mr. Thos. Robinson is but a second edition of Mr. Cole, with all his vices and none of his virtues. His Pastoral Scene, North Easton (313), is hard, opaque, and disagreeable in tone, though not without a certain rude vigor. Both these artists would do well to study the beautiful Van Marcke (521), a new importation, in the Allston room, to note its sparkling texture, looseness of handling, and masterly drawing. The cattle exhibit the greatest variety of form and color, from the pretty white calf to the fine black cow. The bit of landscape beyond is unrivalled, so fresh is it and strong, so solidly painted without being heavy. Mr. J. Appleton Brown's sketches (for we must call them so) have the true ring of nature, the genuine out-of-door feeling. Any one who loves the open air, the fleeting, fleecy clouds, the deep blue sky, who loves to feel the breath of nature on his cheeks, must also love Mr. Brown's studies. These are Nos. 371, Spring, 372, Saturday Afternoon, Autumn, and 445, Willows. Mr. R. Swain Gifford, too, strikes this out-of-door note. He develops his pictures more fully than does Mr. Brown; nor do they lose their freshness in the process. Nos. 410 and 413, Indian Summer, Dartmouth Moors, and Old Trees, Coast of Massachusetts, are excellent specimens of his brush. We regret that he contributes none of his water-colors, which are fully equal to his oils, if not better. Mr. George Inness is a veteran exhibitor, a warrior who has given and taken so many

hard knocks that it would be superfluous for us to add thereto. Those who are interested in his talent can see him at his best in No. 400, A Passing Thunder Storm, and at his worst in Nos. 384 and 411. Mr. E. M. Bannister sends us from Providence a powerful landscape, The Woodman. The gradations are good and the "values" admirable. Mrs. S. T. Darrah's Coast Scene near New Bedford is also strong and well sustained. Mr. Jewell, ever faithful, but without brilliancy in his studies, contributes an excellent picture No. 301, Mosque of Kaid-Bey, near Cairo. The reflected lights are particularly warm and clear, — a peculiarity of Eastern climes which we find wanting in Mr. E. L. Weeks's cold, sunless Street in Tangiers (No. 303). Mr. Jewell also exhibits a good Venetian study, No. 383. Were it not for the puerile figure and the bizarre panel, which seriously compromises its tones, we should admire Mr. Wm. Sartain's Arab Lane (344). We cannot compliment Mr. Frank Rogers on his dogs, No. 422. Were the picture less pretentious we should have passed it by in silence. Mrs. Ellen Sturgis Dixey's Jasmines (414) is an admirable bit of color, and well worth the attention of her flower-painting sex. No. 448, Still Life, by Mr. George Hoesslin, is good, inasmuch as it is a picture, and not a mere conglomeration of bric-à-brac equally lighted and equally finished from the centre to the frame. Mr. C. H. Miller's landscapes, 346 and 364, are rich and juicy, though a trifle spotty. Mr. Robert C. Minor's Evening (427) is also rich and mellow. It is interesting to compare such pictures as Mr. W. T. Richards's 327 with the modern landscapes. Verily, we have improved! We know that the duties of the hanging committee are no sinecure, that their task is a thankless one, but we cannot see why they should have hung (or rather we can see and reprove them for it) Mr. W. M. Brackett's live fish (458), pompously dubbed the Monarch of the Stream, in a place of honor. The public has too long been beguiled by such cheap art.

It is well that we should not linger in the Allston room. To pass judgment on the foreign pictures, many of which have been thoroughly discussed elsewhere, would necessitate a comparative analysis of the different European schools too elaborate for this notice. Let us pass on to the room where the drawings and water-colors are hung.

As far as *aquarelles* are concerned we are but babes. There is little temptation to excel in a department of art unappreciated by the public, save the temptation to be a pioneer, an innovator, a reformer. People are strangely prejudiced, or rather ignorant, concerning the durability of water-colors. The blackening and cracking pictures in the Luxembourg gallery warn us that pigments prepared with oil, if incautiously applied, are far more fugitive than either distemper or water-color. In our own experience we have never met with a deteriorated water-color, but we cannot say as much for oils.

Few of the water-colors are worthy of comment. Many of them are the feeble attempts of aspiring amateurs with a mania for exhibiting. They do not even deserve the notoriety of censure. Messrs. Tiffany and Sartain are New York exhibitors of reputation. Yet they are not pure aquarellists. The former's Cathedral of St. Melanie of Molair (583) is more distemper than water-color, and Mr. Sartain's An Arab Café in Algiers (585), has recourse to peculiar methods. Both seem studiously to avoid transparent washes, which give those qualities that are inimitable in other mediums. Like the modern English they would give to the water-color the texture of oils. Independent of the handling, Mr. Tiffany's picture is neither pleasing nor true. Very different in treatment is Mr. Wm. Tudor's Cool Day, Manomet (617). His strong, clear washes are very brilliant, and his touch is admirable. No. 616, Sketch near Ward's Pond, Brookline, is Mr. E. C. Cabot's best work. It savors strongly of nature. Mr. Cole is not at home with water-colors. He cannot master his materials. His touch is heavy and his color muddy. A water-color is nothing if not clean. Miss S. M. L. Wales and Miss Carter compete with their Interiors of Trinity Church, an inspiring subject. Mr. Charles H. Moore's Archway in Venice (No. 580) is a charming and faithful study. His Duomo Window-Head at Florence (591) should hang in the architectural room rather than in its present place. In no sense of the word is it a picture. It has neither effect nor concentration, and as a water-color is very opaque. In both studies we think Mr. Moore uses his white too liberally. Messrs. Langerfeldt, Colman, Werner, Nesfield, Nicoll, etc., represent schools that we recognize, but do not sympathize with. In their way they are excellent. Before laying aside the pen we must call attention to a very artistic charcoal head, by Miss E. H. Bartol, more fascinating even than her master's work eneath it, — No. 634, by Mr. Hunt. We close this notice as we opened it, by hoping that the present exhibition may not be the last of its kind.

CORRESPONDENCE.

THE MOSQUES AND TOMB-MOSQUES OF CAIRO.

I. Cairo, 1879.

Long before the Egyptian coast can be seen, the tall light-house of Alexandria rises up on the horizon, and when the low line of land appears, the white walls of a palace upon the harbor's edge — where in the North would be warehouses — give at once the key-note of Egypt, with its luxury and waste, its extravagant palace sand mud huts. At Alexandria there is little to delay the visitor unless he cares to trace the plan of its former magnificence, for neither the mosques nor recent buildings are of especial interest. Rising on the ruins of its ancient splendor it is simply a modern Levantine port. Immediately on quitting it, however, for the few hours by rail to Cairo, a keen interest is roused at sight of the Nile and its wide, fertile plains, broken here and there by mud villages, which recall scriptural memories, for these mud huts are formed — one can hardly say built — of the same kind of sunburnt bricks upon which the children of Israel toiled, and which the Egyptians of to-day mould from the Nile mud by hand, while the Khedive's many palaces are filled with the last novelties of Parisian furniture!

At Cairo also there are strange contrasts. One walks from the new part of the town with its modern garden — a futile imitation under a Southern sun of the Parc de Monceaux — and its French theatre, into the narrow streets of the "Arabian Nights," gay with brilliant robes and white turbans of Mussulmans from all parts of the East. Apart from the endless interest of the street scenes, there is to the architect an equally inexhaustible one in the mosques, which, several hundred in number, — I believe there is no record of how many they really are, — are full of attractions, both carven and colored. Following the main street from the European quarter across the city, one comes to sand-hills which like a rampart bound the desert. These offer a fine standpoint from which to study the characteristics of the city. The eye wanders over a multitude of slender minarets and graceful domes to the palms fringing the Nile, and beyond to two great pyramids against the horizon, those of Gizeh. Two classes of minarets may be easily distinguished: those which rise in several stories, square, octagonal, and circular, accentuated with balconies upon stalactite *encorbellements*, belong to early periods, from the ninth down to the sixteenth century, — the earliest mosques having no minarets, — while the others, of a single slender shaft with only one balcony about one third of the height from the top, are more recent, and indicate Turkish influence. The former have a wonderful beauty both of proportion and of delicacy in detail. It is curious to note that instead of passing from square and octagon to the circle, as is done in Western towers, they here almost never terminate in a cylindrical story, but usually the cylinder is between the square and the octagon. It is evident that the octagon as a crowning member is more firm and elegant and gives sharper shadows than the cylinder. The domes are of great elegance, usually well raised, and tending to the form which in the arch is called "keel-shaped," that is, slightly flattened towards the top and rising again at the apex. They are carved with ribs or zigzags and sometimes with intricate arabesques. These domes mark the second period of mosque building. The first mosques, which date from the eighth century, consisted simply of a large court, with a fountain for ablutions, surrounded by two or three ranges of arcades, which are increased in number on the side containing the sacred niche, — showing the direction of Mecca, to be faced in prayer; near this is the pulpit, which is entered under a door-frame, and a dozen steps lead to a small platform with a canopy. This design for the pulpit, whether of carved stone or of wood inlaid with ivory, as well as that of the sacred niche with its rich mosaics, seems to have remained the same through all the developments of mosque building. The mosques of the eighth century have a perfectly developed style of the pointed arch, which thus antedates by three centuries the general adoption of the Gothic arch in Europe, and as the date of the Gothic style corresponds with the return of the Crusaders from the East, it is probable that they brought back with them, if not the invention of the pointed arch, at least a fashion for it inspired by this light and beautiful Saracenic architecture. The first change in these early arcaded mosques came in the twelfth century, by the addition at one or two of its corners of a domical chapel over the tomb of the founder. After this the open courts were gradually contracted until they disappeared, and the several aisles of the sanctuary were absorbed into a large hall roofed with richly decorated palm beams; this opens into the central court under the span of one great arch; single arches open from the other three sides of the court into other halls equal to, or smaller than, the first one. The central court is roofed and lighted by a lantern of lattice work.

The prototype of this latter class is the noble building which Sultan Hassan in the fourteenth century built as his tomb, probably the finest example of an Arabian mosque. Standing upon rising ground, just below the citadel, the approach to it by a wide modern boulevard adds to its impressiveness, which is rather that of a great military or civil building. There are no less than eight stories inclosed in its lofty flat niches. Of the same height is the wing or pavilion in which is situated the great niche of the vestibule, whose *conque* filled with stalactite work is less graceful in outline than many more humble examples. Either for defence, or from the shape of the site, — for the mosques seem to have been unhesitatingly adapted to the crooked lines of the streets, — the narrow corridor which leads from this grand portal turns at a sharp angle. While still wondering at this incongruity one steps into a most imposing court, whose lofty walls are crowned by a stone ornament resembling a double fleur-de-lis, whose sharp silhouette it is which in Arabian architecture generally replaces a cornice. From each side of this court opens a gigantic niche or rather apse, vaulted with a simple pointed barrel-vault; these for size and impressiveness are unrivalled; the severity of the bare walls and vault being relieved by the chains of a multitude of hanging lamps. The fountain in the court is roofed by a bulbous dome whose exquisite decorations in color are fast disappearing; in fact, this grand old mosque is fast going to ruin, for want of a little

timely repair. From the recess towards Mecca opens the chapel of the founder, roofed with a noble dome, brought down upon the square plane by enormous pendentives, reaching half way to the floor. Thanks to the dilapidation of one of them I discovered that their stalactite work was of wood, and not of stone, as it appears, at least to Northern eyes, for once seeing their construction revealed, the function of the pendentives seems frankly that of a mask, as they are attached behind to a beam which steadies an arch sprung across the corner to support the dome. The walls of this chapel and the apse towards Mecca are richly adorned with mosaics and inscriptions. Inscriptions in the graceful Arabic or older Kufic characters are one of the chief beauties of Saracenic architecture. Painted or carved in bands or panels, their invariably good effect suggests the possibility of doing something with our Old English or Black-Letter alphabet, as their forms would lend themselves better than our common alphabet to gracefully covering a given surface; not that the Arabians always occupy the space uniformly, as often they twine their lettering in rather in groups.

Though the mosque just described is the grandest example of the Arabian style, the later buildings went on gaining organic unity and delicacy, though the buildings were afterwards on a smaller scale. The most perfect of this latter class are the mosques and tombs of Kaid-Bey. The latter is one of the group of tomb-mosques just out of Cairo, commonly called the "Tombs of the Khalifs," and, though small, has the most perfect exterior of any of the mosques. Its intricately carved dome and richly designed minaret are the most perfect examples of their kind. On the other hand, the mosque built by the same founder in the city has the most delicately designed interior. The plan of these two mosques is identical and is a typical one. In the centre a court — whose rich roof is pierced by a lantern of lattice work — gives access to two large and to two small niches or apses. On each side of the smaller arches are decorated flat niches, each inclosing a small window, while delicate stalactites fill the *conque*. The classic builders would have sunk their niches deep in the wall, destroying, by these small cavern-like holes, the breadth of the design. But the Arab, with his fine feeling for the value of surface, has kept them shallow and so filled the *conque* with delicate prismatic work, thus engraving his design upon the wall rather than piercing it. I used the word prismatic work, because this delicate *motif*, with its flat triangular niches overlapping one another, is quite different from the real stalactite work with pendants, though commonly all the species of this geometrical corbelling go under the name of stalactite work. Beginning with simple constructive divisions in the vaulting of their niches, this geometrical system can be traced into mazes of intricacy, where the eye with difficulty can discover any controlling principles of geometry. Yet they may be found by study, and from this fact I doubt that imitation of natural stalactites was the origin of this most characteristic of Saracen motives. In it they found full vent for the active fancy which revelled in arabesques and all lineal combinations, for besides using it to fill all awkward corners and to adjust different planes, designers never seem to have hesitated at a difficulty without finding a solution in this ingenious ally. R.

ARCHITECTURE AT THE EXHIBITION OF CONTEMPORARY ART.

BOSTON.

THE architectural exhibition has a sort of every-day look, which is not at all to its discredit, but on the contrary adds greatly to its interest in the eyes of any one who desires to see what sort of buildings are getting built nowadays. There are perhaps no drawings here which have been prepared for this occasion, — few indeed which appear to have been prepared for any occasion beyond the ordinary business of the office. It is a collection of office drawings, covering almost every variety of subject, from a stable to a university, and every style of rendering, from the slightest preliminary sketch in lead-pencil to the most elaborate perspective in water-color, with landscape thrown in. Nothing could be contrived more interesting to the professional architect, as showing him at a glance the various habits of design and methods of drawing among his brethren; the only regret is that the collection could not have been made to embrace the work of more architects from other cities, less familiar to the great majority of vistors. Eight architects from New York have sent drawings, and one from each of the cities of Providence, Philadelphia, Baltimore, and Cincinnati. With these exceptions, the collection of some one hundred and fifty drawings is the work of Boston men exclusively.

As to number, the country houses probably carry the day; there are between thirty and forty of them, and they are not the least interesting part of the collection. If a national American style is ever evolved from our somewhat confused practice, it ought to make its début in the country house, where the habits of family life and the almost universal use of wood for the walls combine to make it more difficult, as well as more unreasonable, to follow the style of foreign nations than in public edifices or the buildings of city streets. It is therefore peculiarly encouraging to mark the steady improvement in this class of buildings, and the increasing tendency to solidity of design; this is equally seen here in the houses of Messrs. Cabot & Chandler, Mr. Emerson, and Mr. Carl Pfeiffer, widely as they vary in other respects. I fear the extreme solidity is sometimes rather apparent than real, and that the massive timber framing so conspicuously indicated on the surface would not be discovered on reaching the skeleton. But this, if it be a vice, is a pardonable one, if for nothing more than the homage it pays to the answering virtue. I wish it could be said that with the increasing solidity an increasing simplicity went hand in hand, but I think the plans and the composition grow even more studiously irregular and tormented, in the search for the picturesque. In this respect the designs of Mr. McKim, of which two or three are here shown, though eccentric in plan, and affecting, perhaps, in too marked a degree, the style of the ancient English manor house in the days when people had not yet learned how to live comfortably, are yet a relief; for running all to length as they do, they afford the long, unbroken ridge-lines and broad, quiet surface of low wall and roof which give repose to the design. One of Mr. Pfeiffer's designs, No. 766, a country house, mostly of wood, skilfully broken up, but whose masses are brought into harmony and subjection by a round tower of stone with an open loggia at its top, crowned with a strong conical roof, seems to me to have nearly hit the mark in combining picturesqueness with dignity.

Of city houses, as of street buildings, very few are shown. Messrs. Ware & Van Brunt's design for a house in New York, two designs of Mr. Lewis for houses on or near Commonwealth Avenue, and a quiet and simple yet sufficient front by Messrs. Cabot & Chandler on Marlboro' Street, are all that occur to me among the former class, if I except Mr. Luce's picturesque house at the foot of Mount Vernon Street, which belongs rather among the country houses. Of street buildings, I remember chiefly Messrs. Peabody & Stearns' two façades for the Howard Bank, and their perspective of the Mutual Life Insurance Building, Mr. Preston's fine drawing of the proposed building in Liberty Square, Messrs. Sturgis & Brigham's outline elevation at large scale of the Hunnewell Building, a figured working drawing such as ought to appear oftener among the more showy perspectives, and a dark little photograph of a small building in New York by Mr. Stratton, called the School of Industry, a low brick front, with round arches undecorated, and a broad flat oriel running through two stories, the whole treated with great reserve and refinement.

Of more important public buildings, we observe Mr. McArthur's large drawing of the Philadelphia city buildings, in which, notwithstanding their extent and costliness, it is impossible to feel much interest, Messrs. Sturgis & Brigham's fine Renaissance design for the Chicago Court House, and Mr. Post's New York Hospital, a large, lofty, many-windowed façade, quiet and well managed, but whose five stories make one shudder at the risks to which some hundreds of helpless wretches are needlessly exposed. Messrs. Ware & Van Brunt's study for college buildings is an interesting project, and, though but a sketch, is carried far enough to exhibit ingenuity in planning and grace in design. Three of the competitive designs for the Milton town hall are here, but scattered in various parts of the room; it is a pity they could not have been hung together and the rest added. Indeed, if one were disposed to grumble, he might say some savage things about the arrangement or lack of arrangement of the drawings in these rooms. There is no classification as to subject, authorship, style of drawing, or anything else, and worst of all some interesting drawings are hung so high as to be quite beyond an ordinary eyeshot. A pen-and-ink drawing by Mr. Luce of some of the decoration of the Holyoke opera house, which one would like to examine somewhat nearly, is not even hung at all, but is set up on top of one of the cases. All this seems the more unnecessary that one of the architectural rooms is by no means full, but has room on its walls for many more drawings at a reasonable height.

Very few interiors are to be seen, which is remarkable, considering the attention which is now paid to the interior decoration of dwelling houses. The only example I remember as noticeable is No. 701, by Messrs. Cabot & Chandler, a dining-room, long and low, treated with great simplicity and gravity, and quite free from that overmuchness of design which is the especial bane of our domestic architecture. A.

WESTERN ARCHITECTS.

LAWRENCE, KAN, May 3, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — Your New York correspondent, in his criticism on the competitive designs for the new Union League Club House of that city, seems to use unnecessary harshness with reference to building committees of Western towns, and impliedly to Western architects. This, from the standpoint of the profession in the West, is entirely uncalled for, and is getting too stale to be good. All of the Western architects are men of Eastern training, anxious and earnest in their endeavors to advance the prestige of their profession; and without the many advantages to be derived from institutes, and the opportunities to copy details from fine buildings on every hand, they are trying to work out their own salvation.

Nine tenths of the casualties resulting from poor construction occur in Eastern cities and towns, and while our public institutions do not boast of as fine exterior effect and elaborate detail, they are certainly as well arranged and as well constructed as Eastern buildings.

In competitions in Eastern cities in which Western architects have engaged, we find them holding their own against their highly cultured and all-wise brethren of the orient: notably in the recent case of the Patent Office restoration and extension, and in the competition invited by the editors of the *Sunday School Times* (Philadelphia)

for a Sunday-school building, where the first premium went to Cincinnati, the second to Princeton, Ill., and the third to Kansas, while one from New York city and another from Philadelphia received honorable mention; this was out of fifteen competitors. The building was ultimately erected in Philadelphia as a combination of the Cincinnati and Kansas plans.

Let us have no more of these scurrilous allusions. We do not ask for undue praise, nor to be *patronized*, but we do ask to be let alone.

Yours, etc., WESTERN PROGRESS.

PUBLICATIONS RECEIVED.

THIRTEENTH ANNUAL REPORT OF THE TRUSTEES OF THE ASTOR LIBRARY to the Honorable the Lieutenant-Governor of the State of New York and President of the Senate. January 8, 1879. Senate Document No. 11.

FIRST BIENNIAL REPORT OF THE TRUSTEES, ARCHITECT, AND TREASURER OF THE ILLINOIS EASTERN HOSPITAL FOR THE INSANE, at Kankakee, October 1, 1878. Springfield: Webb, Magie & Co., State Printers. 1879.

IMPROVED DWELLINGS FOR THE LABORING CLASSES. The Need, and the Way to Meet it on strict Business Principles, in New York and Other Cities. New York: G. P. Putnam's Sons. 1879.

TENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF MASSACHUSETTS. January, 1879. Boston: Rand, Avery & Co., Printers to the Commonwealth. 1879.

NOTES OF EXPERIENCE AND INEXPERIENCE.

22. WELLS AND CESSPOOLS. — If the open drain tiles are within twelve inches of the surface, the pollution of the soil is almost nothing, probably by reason of the rapid oxidation of the organic matter by the air contained in the pores of the upper soil. "Open-Joint" will remember that where sewage is thrown directly on the surface, the effluent water, after filtration through a few feet of soil, is purer than most drinking-water. If a ledge of rock sloped from the vicinity of the outlet drains towards the well, or if the soil were very porous, it would be safest to use precaution. By making a little diagram, showing the levels and distances of the bottom of the well and the first outlet drain-pipe, an approximate judgment could be made of the likelihood of any matter reaching the water. Supposing the liquid to diffuse itself through the ground up to an angle of thirty degrees with the horizon, if that line did not reach the bottom of the well, it might be considered absolutely safe, unless in case of the existence of a ledge. If the soil were very porous, the angle would be greater; if very compact, it might be less; but the compactness would restrict the diffusion. This might be called precaution with a large factor of safety, for the small discharge from a few feet of pipe out of hundreds would be insignificant compared with the efflux from a leaching cesspool, forced through the ground often by a hydrostatic pressure of ten or twelve feet of water, and of course pouring itself mostly through the easiest channel whenever it has found one. C.

22. WELLS AND CESSPOOLS. — One might as well ask, How far must I keep from a small-pox patient to be safe from infection? It is easy to say in answer to both, Keep as far away as you can; but the writer would not consider it safe to have an open joint in a drain nearer to a well that is used for drinking-water than ten times the vertical depth of the bottom of the well below the level of the nearest "open joint." It is often immaterial whether the *top* of the well is higher or lower than the drain. The *bottom* of the well is the point from which you get your water, and if this bottom is lower than the leaky drain by ten feet, it should not be nearer than one hundred feet, depending on the nature of the soil; some cases would render even this an unsafe proximity. Many drains that are supposed to be tight are laid close by the wells without much thought, while a slight imperfection in workmanship, or a slight heaving by frost, or settlement, may make every joint an open one, from which the sewage may escape. Any drain is therefore a bad neighbor to a well, without the most thorough workmanship and painstaking. EDW. S. PHILBRICK.

20. BRICK DRAINS *vs.* GLAZED DRAIN-PIPE. — "Pump Chain's" trouble with his drain-pipe is only the inevitable consequence of the use of any drain for sink waste. Perhaps a little more care about throwing grease down, and some means for protecting the pipe to the trap from losing its heat and so chilling the grease, such as wrapping it with hair-felt where exposed, together with an occasional washing out with a solution of caustic potash, would help him. Probably the joints in the pipe were not properly cleaned out, and the projecting cement catches the sediment.

The old mason's assertion about the superiority of brick drains is simply an illustration of the amazing ignorance and carelessness of the average mechanic about his own business. In the language of a circular which I received this morning, "Scientific theories is the cause of so much loss and disappointment to purchasers of furnaces;" and not only furnace makers but other manufacturers and mechanics seem carefully to avoid the dreaded contamination of scientific knowledge. I have heard a foreman of masons assert that lime mortar set more quickly than cement; a first-class plumber say that block-tin pipe corroded faster than lead; and have seen a carpenter truss a partition with the truss upside down, plasterers put hair into the fresh slaked lime and leave it for days, and many other gross displays of ignorance of the one business which they professed to understand. The poor architect, who, when he specified a truss, had not supposed that it would be necessary to state which side of it should be uppermost, generally gets the blame for these little errors on the part of the workman; while the workman, when the ceilings crack, or the plastering falls off, or the drains, which he has laid on an up-hill grade, begin to choke, accounts to the owner for everything by mournfully hinting that too much "book-larnin'" was in some way, he does not say how, the source of the trouble.

T. M. C.

20. BRICK DRAINS *vs.* GLAZED DRAIN-PIPE. — We wonder if the mason who thinks that a brick drain is more self-cleansing than a pipe drain is accustomed to eat his dinners from unglazed pottery? If he really believes his own theory, he ought to carry it into practice by discarding all glazed crockery-ware from his home, and eating his meals from flower-pot saucers. He would save much expense thereby, and if he is right, it would be more cleanly.

If "Pump Chain" will read in the last Report of the Massachusetts Board of Health, just published, the article by Mr. E. C. Clarke on "Defects in House Drains," he will find the question more fully and satisfactorily answered than your columns have room for. EDW. S. PHILBRICK.

NOTES AND CLIPPINGS.

THE STATUE OF LIBERTY. — The French Minister of the Interior has authorized Senator Martin, Vice-President of the Committee of the Franco-American Union, to organize a lottery of three hundred thousand one-franc tickets, to raise a fund for the completion of Bartholdi's Statue of Liberty, which has been presented to the United States, and is to be put up on Bedloe's Island, New York Harbor.

THE CUNEIFORM INSCRIPTIONS AT NINEVEH. — "One of the principal objects kept in view during these new excavations," says Mr. Grattan Geary in speaking of the excavations now making at the site of Nineveh by Mr. Hormuzd Rassam, "is the recovery of the remainder of the historical and legendary tablets, which were deposited in the royal libraries. The completion of the series giving the Isdubar legends, amongst which the account of the Deluge is the most remarkable, is above all things desired. The tablet giving the portion of the legend relating to the Deluge, which was first deciphered by the late Mr. George Smith, was discovered by Mr. Rassam; and therefore there is a special fitness in his being intrusted with the task of completing the search subsequently begun by Mr. Smith for the tablets still required to complete the series. He was so far successful in his operations that he had, within a few months of my arrival, discovered nearly fifteen hundred tablets, or portions of tablets, bearing cuneiform inscriptions. Additional parts of the Isdubar legends are amongst them, as well as lists of gods, many prayers and invocations, and other matters throwing light upon the religion of the Assyrians. Not the least valuable of the cuneiform records found would have been lost forever but for the steady observance of the rule that nothing, however unpromising, was to be passed over. In excavating in the royal library of the palace of Sardanapalus — or Assurbanapal — a piece of wall, four or five feet high and eight or ten long, composed of sun-dried brick, stood exposed. All the débris around it had been removed and sifted, and nothing more was looked for. It was proposed to throw the rubbish from a new part of the cutting in the cleared space, and cover up the bit of useless wall. But Mr. Rassam directed that the wall should be first knocked down. In removing it the men came upon a literary treasure, equal in importance to any yet recovered from the whole site. Built into the wall, and as it were imbedded in the sun-dried bricks, was a large decagonal terra-cotta cylinder, some twenty-two inches long and two feet in circumference. It sides are closely covered with very small cuneiform characters, in ten columns, exactly like those of a modern newspaper. There are 1,275 lines in all, containing an elaborate account of twenty years of the reign of Assurbanapal, and all his wars against Egypt. The columns are nearly the width of those of an average daily newspaper, and rather more than half their length. The subject is divided into sections by what a printer would call 'rules' across the columns. Some sections occupy half a column, others a column and a half. We may expect great things from the translation of this most elaborate chronicle. It dates from the year 640 B. C."

AN UNUSUAL COMPLIMENT. — On the completion of the building in Cincinnati which is to be used as the Club-House of the Allemania Society, Mr. Nathan Drucker, on behalf of the society, presented Mr. James W. McLaughlin, the architect, with a set of resolutions, accompanied by a beautiful silver service.

PAINTINGS IN THE PALACE OF THE POPES AT AVIGNON. — The first question with which the new Commission for the Preservation of Historical Monuments in France is interesting itself is, What is the best means of preserving and restoring the paintings in the Palace of the Popes at Avignon, which are in daily danger of injury by the French soldiers, who are quartered in the building as barracks? The paintings are of Italian origin, and date from the fourteenth century.

THE NEW HAVEN STATE HOUSE. — The condition of the old State House at New Haven is such that the attention of the authorities has been called to it regarding its safety. It is feared that the snow and frost of another winter will cause the falling of the west wall, which has already settled away from the building nearly a foot.

ARTIFICIAL SANDSTONE. — *Glaser's Annalen* contains a description of an improved method and apparatus for the manufacture of artificial sandstone. A thorough mixture of four to six parts of fine sand and one part of slaked lime is exposed for about three days to a high temperature and a pressure of more than three atmospheres, causing the formation of a silicate of lime which acts as a cement, so that the mass, when cooled down to the ordinary temperature, hardens. This hardening process continues for some weeks by exposure to the air, so that finally a product is obtained which is as hard and solid as good sandstone. The apparatus consists of a tank, into which the mixture is filled, and in which it is heated and stirred by a steam pipe, provided with a number of arms and rotated by belting or gearing. After the mixture has reached the proper temperature the steam is cut off, and a second vessel, inclosing the tank on all sides, is put into communication with the boiler. By this means the mass is heated for the period necessary. It is then run into a brick machine and shaped into the forms required. The process, it is claimed, effects great economy, especially for the manufacture of window-sills, etc. The apparatus used is made large enough to produce 250 cubic feet of material in every charge, — requiring, generally, three to four days.

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CONTENTS.

The Chicago Custom-House trial moves as deliberately as it promised. The first four days having been taken up with the opening speeches of the prosecuting attorneys and the replies of the defendants' counsel, in the course of which Mr. Swett took occasion to complain that the prosecution was carried on in the newspapers as well as in the court, three more were occupied in reading the various contracts and letters, and the display of vouchers and record books which were considered necessary to give the jury an understanding of the case, — a dispensation which was not softened by the official threat that not less than a thousand letters would have to be read before the trial was finished. After this the examination of witnesses for the prosecution was begun. The testimony of the first witness, Kalstrom, one of the clerks employed on the work, described the systems of inspection and record that were used in carrying on the work, which apparently were as well devised as one could expect for protecting the Government under a system of contracts in which real protection was almost impossible. The next witnesses were Mr. Boyington, one of the members of the second commission which examined the Custom-House under Mr. Potter's administration, and which reversed the decision of the first commission by recommending that the building should go on, and Mr. Holman, Mr. Potter's superintendent. Both these gentlemen testified to what the public already know pretty well, the inferior quality of much of the stone used in the building, and gave their opinion that an efficient inspection would have condemned a great part of it. The testimony of the witnesses who followed was mainly to the effect that the stone was bad and badly patched, excepting in the second and third stories, and the work needlessly delayed. There is no occasion for going here into the detail of the questions involved in the trial. Those who remember last year's investigation, or who will take the trouble to look back to the numbers of the *American Architect* for May 4 and June 1, 8, and 15 of last year, will have a sufficient idea of the conditions of the case. In the testimony so far there was little that seemed to bear on the question of conspiracy, and indeed at last accounts we hear that when the prosecution closed its case Messrs. Potter, Hill, and Wheaton were discharged by direction of the court, on the ground that there was no evidence against them, while the trial of the other defendants proceeded. The court went so far as to declare, in view of the case submitted by the prosecution, that these three should never have been indicted.

In a race between the Executive Committee of the World's Fair in New York and the committee of the United States Board of Trade, the first mentioned seem likely to get the lead. Their project as published differs much from those which have hitherto been carried out, inasmuch as it puts the whole exhibition under the patronage and the administrative care, though not the financial, of the General Government. At a meeting held in New York last Saturday, a draft was adopted for a bill that it is proposed to lay before Congress. The bill provides that a United States International Commission of one delegate from each State and Territory shall be appointed by the President upon nomination of the several governors, whose duty it shall be to prepare and carry out a plan for an international exhibition at New York in 188–. The commission, which is to be unpaid, is to make the preliminary arrangements for the exhibition; fixing its date, its opening ceremonies, the necessary custom-house regulations, the classification of exhibits, the appointment of judges and examiners, and the award of premiums, and holding the necessary intercourse with the representatives of foreign nations. The commissioners are to be appointed within three months of the passage of the bill, and are to report their scheme to the next following Congress. Whenever this shall have been done and the governor of New York shall have given notice that provision has been made for the necessary buildings, the President is to make proclamation of the exhibition, and invite foreign nations to take part in it. The expenses of the fair are to be provided for by an incorporated board of finance, which shall have power to issue stock to the amount of ten millions of dollars, in shares of ten dollars each, being governed by a board of twenty-five directors, who are to have the whole pecuniary management of the undertaking; certificates of stock being furnished by the United States Secretary of the Treasury, but no pecuniary liability being incurred by the Government, except that the board of finance, when they have collected a million and a half of dollars from subscriptions and expended it, may call on the Secretary for a like amount, which amount is to be repaid the Government before any dividends are paid or capital refunded.

This scheme is in some ways an improvement on its predecessors, chiefly in that it puts the authority of the whole undertaking where propriety requires that the authority of an international exhibition should be, in the hands of the Government. This, which is necessary both for the avoiding of local jealousies, and to give the exhibition standing before foreign nations, was the thing neglected in the Philadelphia plan, and was at one time near making a failure of the whole scheme. In the present plan local influences are carefully effaced, except in appointing the place of the exhibition at New York, which was a foregone conclusion. The vexed question where the grounds shall be is prudently left undetermined: we may hope at least that the Central Park will be delivered from it. There are some obvious difficulties, such as the due division of authority and duties between the commissioners and the board of finance, and the unwieldy size of these bodies. The geographical distribution of commissioners, too, will give, as we have seen by past experience, a less capable commission than might be got by a free selection. This difficulty is almost inseparable from a government commission of such magnitude, but then, why need the commission be a large one? The answer to this question may be that only such a commission would be acceptable to Congress, an explanation which does Congress little credit. The chief doubt in the whole matter, however, may be whether it is not too soon to move in it at all, or at all events with such rapidity as the bill proposes. 1885 is, we should say, the earliest year in which it would be worth while to hold another exhibition. To crowd them will surely discredit them.

The Pennsylvania Museum of Industrial Art and the schools connected with it have been struggling bravely against a lack of resources which one would hardly have expected to have befallen them, even in hard times, in a city at once so wealthy and so industrial as Philadelphia. The gift, or loan, of Memorial Hall has not proved an unmixed blessing, at least economically, on account of its deplorable workmanship. The covering of the roof proved very unsubstantial, and the zinc statuary upon it in its disintegration, as well as some of the sixteen eagles in an erratic flight, have been damaging to the immense skylights, all which, with other faults, has made necessary repairs to the amount, it is said, of seven thousand dollars, in the course of the year. That the opportunity, and the effect of the building, might have been improved by removing these ornaments, will perhaps be the first thought of a good many people. The trustees, finding the schools in danger of failing for want of funds, have made a special appeal to manufacturers for its support. Their circular, after reciting the purposes of the schools and of the Museum, and the good results already obtained, and adjuring the manufacturers of Pennsylvania not to let the undertaking fail for want of means, propose that a guarantee fund of five thousand dollars a year, for three years, be raised to meet what deficits may occur. It has been decided that the Museum shall be kept open on Sundays with a low price of admission, for the sake of the artisans of the city, the entrance fee being made

necessary by want of sufficient funds to provide the force of attendants which would be required on free days. People who at the Centennial saw the ticket of the Pennsylvania Museum attached, as it seemed, to innumerable works of art, would look with great regret to see a collection so generously begun fall into neglect; and we may hope that the schools, which were undertaken with much enthusiasm, will not be allowed to languish, even though we cannot altogether share the comfortable hope of the trustees, that the pupils, who have now finished two years out of the intended course of three years, will at the end of that time "become competent designers or instructors of others." Art is long.

The new Archæological Society of which we have spoken lately was organized in Boston on last Saturday, under the rather high-flown title of The Archæological Institute of America, a title which it is hoped to justify, as far as may be, by extending the membership widely throughout the country. The society is formed, according to the first of the regulations adopted by it, "for the purpose of promoting and directing archæological research, by the sending out of expeditions for special investigations, by aiding the efforts of independent explorers, by publication of reports of the results of the expeditions which the Institute may undertake or promote, and by any other means which may from time to time appear desirable." The plan of organization was made judiciously simple, and well suited for efficient working, the administration of the society being intrusted to an executive committee which consists of the president, vice-president, secretary, and treasurer, *ex officio*, and five specially chosen members. To them are delegated all the working powers of the society, subject to the necessary control of the members on occasion. The membership includes life members, made so on payment of one hundred dollars, and annual members, who are to pay an assessment of ten dollars yearly. It was voted that the lists should remain open till three hundred and fifty persons had subscribed themselves, after which additional members must be elected by the executive committee. The officers chosen were Professor Norton, of Harvard University, and the Hon. Martin Brimmer, president and vice-president; Professor Goodwin, of Harvard, and Professor Ware, of the Massachusetts Institute of Technology, and Messrs. Francis Parkman, H. W. Haynes, and Alexander Agassiz, members of the Executive Committee.

The second annual report of the New York State Survey shows the progress of the work thus far by four sheets of maps, to which the director, Mr. Gardner, appeals, to emphasize the need of his undertaking, since he finds none of the preceding determinations trustworthy enough to be incorporated even in his preliminary sheets. This difficulty he further insists on in his reports, saying that all of the two hundred towns and villages whose position he has determined are misplaced by one or two miles on the existing maps, for want of previous trigonometrical determination. There are no data which may be trusted even for the courses of such rivers as the upper Hudson, the Mohawk, the Delaware, or the Susquehanna, says the report; and the same thing is true of county lines, where indeed they are not actually lost. After careful search of the original records it has been proved impossible, for instance, to ascertain the area of Onondaga County within ten thousand acres,—that is, within fifteen or sixteen square miles. This being the case it is not surprising that people are justified by the courts in rejecting, because of their inaccuracy, the county maps for which they have given their subscriptions to canvassers, nor is the director without justification in complaining that "no one can tell the endless errors in minor detail of a chart whose misplacements are counted by miles at the most important cities, and which puts the warehouses of Oswego in five fathoms of water." These things we quote because they and worse things are undoubtedly true of New York and of most of the States, as any one who has had much occasion to use the ordinary county maps has reason to know, and because the question of surveys is more important and more pressing than is commonly realized. The work of the survey has been extended north and south from the central belt of which the triangulation was first fixed, the topography being gradually filled in and many heights determined, as well as stations located; care being taken to identify the stations by landmarks, which are expected to be permanent, such as church spires (which, however, our correspondent, E. A., might refuse to consider permanent) and stone monuments. The actual cost of the survey for the year 1878 has been a little over fifteen thousand dollars.

The telegraph tells us of the death of Gottfried Semper, the architect of the famous Dresden theatre and author of *Der Styl.* Semper was born in 1804 at Hamburg, where his boyhood was passed. Later, after finishing a course at the University of Göttingen, being disappointed in his desire to enter the artillery arm of the Prussian army, it is said, he turned to the profession of architecture. This he studied first at Munich and afterwards for three years at Paris. Leaving Paris after the revolution of 1830, he travelled in Italy, Sicily, and Greece. With this training, and the influence of the time at which his studies were carried on, it was natural that his predilections should be for classical architecture. He became specially interested in the study of polychromy, in his after practice of which he followed what he believed to be the method of the Greeks. In 1834 he was given a professorship at the Academy of Dresden. There he won the favor of the king, and was allowed to test his theories of color in the decoration of the cabinet of antiquities in the Royal Museum. Soon after he built the Court Theatre, which, outwardly at least, was one of the most successful of its kind, and in which he carried out the French principles of theatre-planning with a straightforwardness beyond that of the French themselves, the plan of the auditorium and corridors being distinctly shown in the great apse, which was its most elegant and conspicuous feature. He also built the new synagogue and Women's Hospital of the same city. In 1846 he began the new museum, in which, since it was the north wing of the *Zwinger*, he was constrained to adapt his design more or less to the *rococo* architecture of that detestable palace. He was not able to finish it, although it was carried out according to his designs, for in the political disturbances of 1848, being of the revolutionary party, he was obliged to leave Germany. He then went to England, where he lived in honor some years, and whence in 1856 he went to Zurich to be professor of architecture in the Polytechnic School there.

We have not at hand at this writing the means of following Semper's later career, but he was recalled to the rebuilding of the theatre at Dresden, which was burned a few years ago, and which he rebuilt, or was rebuilding, after a design that to our eye lacked the charm, as it did the simplicity, of his former building. Somewhat recently he has been called to Vienna, where he was made imperial consulting architect (*K. K. Oberbaurath*) and member of the commission on the museums and the new court theatre. His scholarly tastes led him to write several books upon architecture and æsthetics, among which are *Die Vier Elemente der Baukunst; Ueber Industrie, Wissenschaft und Kunst;* and his more famous work, *Der Styl in den technischen und tektonischen Künste* This last work, which has gained a high reputation, was published unfinished, only two of the three projected volumes being issued. A second edition is now coming out under the care of his son, Dr. H. Semper, but the third volume is still wanting, having been delayed, says the son in his short preface, at once by the number of buildings which claimed his father's attention, and by his failing health. That he died in Rome on Sunday is all that we hear as yet of his death.

THE RECIPROCAL DUTIES OF ARCHITECTS AND THEIR EMPLOYERS, ESPECIALLY IN RELATION TO PUBLIC BUILDINGS.[1]

III.

Is it too uncharitable to suggest that the root of all the trouble implied in the questions pertaining to my specialty, which you have proposed to me,—as in most other questions, more or less important, now agitating the better portion of society,—is this: The forces of our community in this generation are employed not nearly enough with public-spirited aims and far too much in the interest of personal greed and self-aggrandizement? Art, as applied in daily life to the enhancement of what would otherwise have merely utilitarian uses, and as distinct from art the uses of which end measurably or absolutely in itself,—like statuary and painting and especially music,—the art of architecture, as applied to our dwellings and other resorts, with all that is comprised in them, is not exempt from this sordid *quasi* law, any more than science, literature, politics, charity, religion itself. Commercial ambition and social rivalry, almost unchecked, for practical purposes, by any counterpoising deference to spiritual or moral standards, or even to any sentiment for permanent rank and title,—not a very high sentiment *per se,* but less sordid than the worship of money and plutocracy,—or for the birth that implies transmitted capacity for high training (though the lowest professional jockey will sedulously study and proclaim the pedigree of his horses),

[1] Read before the New York Municipal Society, by A. J. Bloor, F. A. I. A., on December 3, 1877, and presented November 14, 1878, to the Twelfth Convention of the American Institute of Architects, by whom it was referred to the Committee on Publications.

have so thoroughly permeated the community, as a whole, that that plain-spoken and, as a rule, judicial-minded organ of the press, the *Nation*, notwithstanding its reputation among many good people for arrogance and cynicism, is probably right in saying that universal corruption prevails in affairs. Is not a political party apparently on the rise that bases itself on what would virtually be national repudiation? National, state, and municipal administrations, to say nothing of commercial and professional combinations, often of vast power and importance, in behalf of private interests, are very generally — may we not say in most instances? — "run" on the same principles, in large measure, that gambling houses are. Legal practitioners become the merest jackals to sharpers. Associations of all kinds dissolve amid the recriminative shouts of their members, while the unwholesome aroma that accompanies pipe-laying and curb-stone operations pervades the atmosphere. No charity — even if it is linked with the agonies of civil war and with a death-struggle for national salvation — is so much ennobled by its sources or its aims that it is not likely to be finally turned to the account of a few wire-pullers, greedy of lucre or a little local evanescent fame. Historical societies follow in the track, crook the pregnant hinges of the knee to the dictum of some time-server, stultify their very name and existence, belie contemporary gratitude, and commit the unpardonable sin against posterity by the utter ignoring or falsification of, or the *suppressio veri* in, some important episode of current history. The pulpit of our churches becomes an auction block for the sale of more or less eligible seats from which to witness the weekly sensational performance, and the incumbent is in reality awarded his salary and parsonage more as the social and socialistic figure-head of ambitious *parvenus* and as the *succedaneum*, for pious folk, of the buskined tragedian, — or better still of the socked comedian, — than as the dispenser of the Bread of Life. Courts of justice and wide-circulating newspapers are bought up, body and soul, by Tweeds, Fisks, and their tribe, who take care that for the finely painted jumping-jacks, whose wooden limbs will dance whan the string is pulled, there shall be gold added to their colors, and for the faithful workers who will not respond, there shall be returned, unhonored, the unswelled claim for services faithfully rendered, or the "clammy touch" of the would-be assassin. It is true that one would-be assassin has gone to his account, through the violence he practised and worked, and one head wire-puller is in jail. But the latter enjoys his reputation and has his little jokes as "the great witness" in an unimpeachable court, and says truly that he neither commenced nor ended in his community the plan commended by the freebooter Rob Roy: —

> "The robber's simple plan, —
> That he should take who has the power,
> And he should keep who can."

The newspapers seem to think it very sad and shocking that a smaller witness should glory, in the same court, over his own robberies, and boldly proclaim, amid the laughter and applause of his audience, that there is not a man in the room who would not, with the same opportunities, do as he had done. But what is really sad is that what he said was probably true of most of the people in the room. And shall we not say outside of it also, considering that the smaller witness receives an "ovation" from his local public when he returns home from the witness stand? Is it to be wondered at then, if under-paid architects, suffering from the ignorance or selfishness, or both combined, of building committees; suffering from the effects of the mismanaged competitive system, as commonly practised in public building work, — whatever project for a new structure that is submitted to them being probably organized as a bonanza for corrupt politicians and their tools, and the "prize plans" "adopted" before most of the competitors have put pencil to paper, — is it to be wondered at if architects, particularly those who have been engaged in public works and have acquired an insight into ways that are dark and tricks that are not in vain for putting money in one's pocket, should be tempted beyond the moral strength of at least a few of them, to follow in the wake of their employers? Is it to be wondered at if occasionally architects, cut off from the restraining influences of inter-professional association, should take their turn as hoodwinkers and strive their best — even if they don't succeed — to lead employers, whose hands hold the public purse strings, from one stage to another of alteration or addition, of tearing down or building up (but all involving expenditure, and proportional remuneration)? Is it to be wondered at if they strike hands with some under-paid and not over-scrupulous office-holder (for almost all responsible officials are under-paid in this country, while a great army of irresponsible ones are overpaid in being paid at all), and join in the game of "addition, division, and silence"? The way to reform such architects, if any such have been or should be developed, is to reform their employers; and their employers will be what they are so long as the public has no higher standard of action than that supplied by the current laws of trade. I say the *current* laws of trade. If trade were pursued in the spirit in which the just appointed minister to the court of St. James says he has, during a long life of business, practised it, there would be little need for any community to seek for higher governing principles. But we have only to read the annals of Wall Street, or the records of the mercantile or carrying or insurance service of any of our great business centres, — we have only to glance over the first newspaper we pick up, to learn on what principles our business affairs are mainly carried on. We know that the inspired observer of old noted that then as now "the buyer sayeth it is nought and straightway goeth and boasteth." The future of commerce must lengthen and increase with the duration of the human race, for there is nothing that has deeper roots in human nature than the elements of trade. But if a great community is to be built up on it, it must be passed under the yoke of the moral law. As long as trade is the dominant force in a community, the special practice which provides homes and other resorts for that community must, like that of all other ministrations to it, share in the characteristics of that trade. Professional practice of all kinds — the architect's no less than the lawyer's or clergyman's — will be colored by it, whether it is pursued in a public-spirited or in a selfish, in a fair or in an unfair, spirit. The stream cannot rise higher than the source, and must more or less partake of its impurities.

NEW YORK YARDS.

I.

In considering the subject of the distribution of space in modern cities we should remember that yards attached to the houses are, merely as yards, of little or no use. By means of yards we give light and air to the rooms in the rear of our houses. But light and air would be secured as well to those rooms if the yard spaces were streets. Besides being used for light-and-air spaces, it is true that our yards are generally used for drying clothes. But they are not always so used. Those families which have their washing done at home have, particularly in the larger and more costly houses, drying rooms within the house, artificially heated. When we consider the cost of the land, we see that, regarding yards merely as clothes-drying grounds, they are rather expensive arrangements. We may remember also that clothes can as well be dried on the top of the house as in a yard, and indeed better, in so far as the air there is purer and moves more freely.

If we look further for the use or cause of yards we see that, before the prevalence of the modern system of drainage in cities, yards were not only used as light and air spaces and to dry clothes in, but they were needed to give room for privies and cess-pools. And as the larger the yard the further these could be put from the dwelling, not only yards but large yards were in those days desirable. But that necessity now exists no longer in New York.

If, then, we are willing to have our clothes dried in some fashion which costs a less sum than the interest and taxes on the vacant ground in the rear of our lots, and one that can be made more seemly than the present back yard display, we see that we have no use, or at any rate no actual need, for yards as long as there is an open space in the rear of a house by which it has plenty of light and air.

A number of houses standing, at least until lately, on the space between Pall Mall and St. James's Square, in London, have no yards. The houses have practically two fronts, one on Pall Mall and one on St. James's Square, the entrance being on the former. They run through from street to square; they are not very deep, having only rooms front and rear, and a hall and stairs in the centre, lighted from above. The most desirable rooms are those looking on the square. The absence of yards seems no inconvenience whatever to these houses, nor does it seem to lessen their desirability in any way.

In New York, on Fifth Avenue above Twenty-sixth Street, are some houses built on lots which run through from Fifth Avenue to Broadway. These houses have yards on Broadway, but the yards are comparatively useless. The windows in the rear of the houses which open on them would be no better nor worse lighted and air-giving if the yards were done away with and the space thrown into the street. The rear rooms in the houses would be really more desirable if they fronted on the line of Broadway instead of being set back in the yards. The owners of the lots have evidently been saddled with land which, from its situation, must be very costly to buy and to hold, but for which, though in a part of the city where land is most valuable, they yet have little or no use under the present arrangement, and hold as yards. Certainly, houses on these lots could be easily arranged so that the absence of yards would be no inconvenience. What is true of houses on such lots in London and New York is true of houses wherever they are built on lots of no great depth and run through from street to street. Were such lots procurable, light and air would be secured to every room in every house without entailing a loss on the owner of the lots by obliging him to leave any portion of them unbuilt on. The struggle between good ventilation and the pockets of owners of real estate, which is at the bottom of much of the bad ventilation of dwellings in New York, as well as in many other cities, would not in such cases exist.

Little as yards are needed for private houses, where there is a street in the rear on which the rear windows of the house can open, yards are still less needed in such cases for hotels, apartment-houses, flats, or tenements. To assure ourselves that this is the case we have only to look at the arrangement of some of the most costly hotels and apartment-houses in New York and Boston, and see how little yard space they have; and this even though there are no such streets in the rear on which their rear windows can open. And to such yard space as there is the tenants of the apartments often do not have access. So, too, in the apartment-houses in France, Germany, and Italy we find that the object of the courts which take the place of our yards, though not occupying so much space, is mainly

to give light and air to the windows opening on them; and the occupants of the apartments do not otherwise often use the courts, and sometimes do not even have access to them. If a family, whether living in a large and luxurious apartment, or a small and plain one, has no other use for a yard or court than as light-and-air space, we see no reason why families living in separate houses should require them.

Compared with yards in other cities, New York yards are especially useless, because they do not give access even to the backs of the houses for carrying away their refuse, and the houses must have "areas" and basement doors in front, which demand that the street on which the house fronts should be wider than is otherwise called for; while such areas present too often, most often in fact, a slovenly appearance. All this uselessness of New York yards tempts to the forgetting of their value as an air-space, and tempts to encroaching on them with over-deep building. Little by little, as convenience requires it and the character of the occupation of houses alters, extensions are put out in the rear of houses, or new buildings deeper than the old take their place, and gradually fill up the space originally intended to be kept open as an air-space. Something of this kind is going on in all growing cities, but nowhere to such a degree and with so much detriment to the health of the inhabitants as is now the case in New York. This is owing to its system of deep, narrow lots with no means of access to the rear. The object of that system was to secure a very large open space in the centre of every block of houses, and so to give abundance of breathing places all over the city. The object is admirable, but the time is past when the system is adapted to secure any longer the ends intended. In fact, it gradually but surely comes to work in precisely the opposite direction.

In New York owners of real estate are forced by this system to buy a piece of land forming the rear of each lot, which it was intended, when that system of lots was adopted, should always be kept open and reserved for air and light space. In order the better to secure that end it is carefully arranged that there shall be no access to it in the rear; for there being no access to it except through the front part of the lot, it cannot be sold off separately. It must perforce be held by the owner of the front part of the lot, and, if he cannot make other use of it, it must be held vacant, and so serve as a ventilator. It was supposed that by this most ingenious system of padlocking the uses to which private property could be put, plenty of ventilation and open-air space would be secured all over the upper part of the city, to the great and lasting benefit of its inhabitants. It has been to their great benefit as long as the intended working of the system has lasted, but that is scarcely for one generation. In many cases, especially those of tenement-houses, wherever the population is densest and breathing spaces most needed, there it utterly fails, and for the most powerful of all reasons, — the interest of the real-estate owner, by the very conditions of the system, is against it.

THE ILLUSTRATIONS.

DESIGN FOR THE FIRST PRESBYTERIAN CHURCH, NORTH, NEW YORK. MR. HENRY KILBURN, ARCHITECT, NEW YORK.

The plans for this church have been prepared for some months, but the general depression of business has delayed its erection. A chapel, however, has been built for the immediate use of the society. A light-colored stone from a neighboring quarry was to be used for the walls, which were to be covered by an open-timber roof. The interior was to be finished in white ash. At the time the plans were prepared the estimated cost of the building, including the chapel, was about $40,000.

TENEMENT-HOUSE FOR THE MANCHESTER MILLS. MR. GEORGE MOFFETTE, JR., ARCHITECT, BOSTON.

These drawings show one of the arrangements of tenement blocks prepared for the agent of the Manchester Mills for the hands. Each tenement has its private entrance from the fire-proof stairways, which are inclosed by brick walls, and are built of brick with iron treads. The rooms for fuel and water-closets are also fire-proof.

HOUSE AT NEWTON CENTRE, MASS. MR. C. A. RICH, ARCHITECT, BOSTON.

This house is to be finished throughout in pine. The exterior is to be painted in shades of olive green, the roof red. The shingles on the walls of the second story are to be painted in a darker shade of the olive green. The shingles below the first story window-sills are to have a batter, and are to be painted in red. The estimated cost is $2,800.

THE MERCHANTS' EXCHANGE, COPENHAGEN, DENMARK. DRAWN BY MR. L. S. IPSEN, ARCHITECT.

It is a disputed point whether King Christian IV. carried the whole of this building away from Sweden, as a reminder of his victory over the Swedes at Calmar, or whether he carried off only the singular spire, with its intertwined dragons or "linden-worms," as they are called in English, not that they are a species of Danish caterpillar, for linden-worm is merely a corruption of the Danish *lindorm*, dragon. It is certain that the spire at least came from Sweden, and that ever since 1624, the dragons have been regarding the four points of the compass.

THE CHURCH OF OUR SAVIOUR, COPENHAGEN, DENMARK. DRAWN BY MR. L. S. IPSEN, ARCHITECT.

The corner-stone of this church was laid by King Christian IV., and the date usually assigned to the building is 1697. The present spire, which forms one of the notable features of the city, is built of wood, covered with lead and copper, relieved here and there by gilding. It was the intention at first to build the spire of stone, and the original design shows that the stone spire would have been a more lowly structure than the present one; the architect, however, was afraid or unable to carry out his design. The church, which is cruciform in plan, is late Renaissance in style, with flat arches and an exuberance of *rococo* work in the interior of which, however, the effect is very rich.

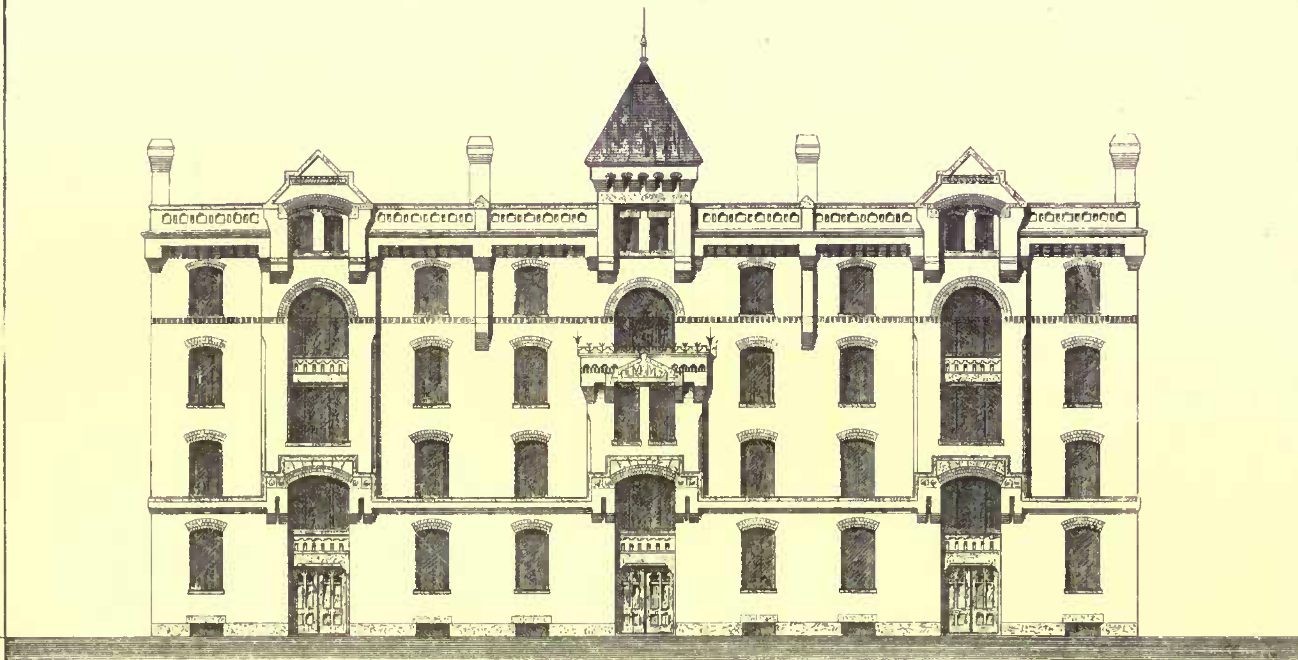
THE DECORATION OF TRINITY CHURCH, BOSTON.

The architecture of Trinity Church is particularly hospitable to high decorations in color, because it affords large interior surfaces, and because its features of construction, unlike the conventional Gothic of the churches, do not make too large a demand upon the decorative scheme. When the architect was permitted to call Mr. La Farge to his assistance in completing this work, the latter found at his disposal, in the first place, ample dimensions and broad, suggestive spaces; and, in the second, he had the intelligent sympathy of those for whom and with whom he worked. He undertook, however, a heroic task, with limitations of time and means, — such perhaps as no painter of monumental art had ever subjected himself to in previous works. He brought to this labor a genuine artist's spirit, strong in its convictions and brave in its hopes, but unused either to the study or to the production of architectural effects.

Let us now consider the architectural conditions of his work; for without a thorough comprehension of the theme as affected by the spirit of the place, we can arrive at no just conclusion regarding the result. The church is cruciform; nave, transepts, and chancel being each about fifty feet wide within the walls, and the interior dimensions being about one hundred and forty feet in extreme length and one hundred and fifteen feet in extreme width. The interior height is somewhat more than sixty feet. The tower which arises over the crossing of the nave and transepts is nearly fifty feet square within, and its ceiling, which is open to view from the interior, is one hundred feet from the floor. The ceilings of the auditorium are of light furrings and plaster in the form of a continuous barrel vault of trefoil section, abutting against the great arches of the crossing, which are furred down to a similar shape, with wooden tie-beams encasing iron rods carried across on a level with the cusp of the arches. The four great granite piers which sustain the weight of the tower are encased with furring and plastering, finished in the shape of grouped shafts with grouped capitals and bases. The whole apparent interior is thus, contrary to the convictions of the modern architectural moralist, a mask of the construction. We do not propose here to enter upon the question as to whether or to what extent the architect was justified in thus frankly denying his responsibility to the ethics of design as practised and expounded by the greatest masters, ancient and modern; it suffices for our immediate purpose to note that the material of actual construction being nowhere visible in the interior, to afford a key of color to the decorator, or to affect his designs in any way, he had before him a field peculiarly unembarrassed by conditions.

The exterior architecture of the church is a very vigorous and masculine form of round-arched Romanesque, affected by traditions from Auvergne and Salamanca, and with a good deal of later mediæval detail, the whole well amalgamated and a proper work for an architect of the nineteenth century. Thus, even in respect to style, the painter had no reason to yield anything of his freedom to archæological conventions; he was left at liberty to follow the same spirit of intelligent eclecticism which had guided the architect.

The tone of the interior, as regards color, being thus left open to some arbitrary solution, the desire of the architect for a red effect was accepted as a starting-point, and this color was adopted for the walls throughout, its quality being solemn and neutral. Either in fact, or by effect of light, or by variation of surface, this color submits to variations in tone, so that it really has different values in different parts of the church; and thus, in the very beginning, we seem to be spared the homely virtue of mechanical correctness and equality of workmanship. The vaulted surfaces of the ceiling are divided into narrow cross-sections by small mouldings of black walnut or black walnut color, and these sections very properly receive the complementary color of red, namely, a greenish blue, with the value of bottle green. These sections or strips are cut up by transverse lines into quarries or squares, each of which is occupied with a form or device of conventional character, appealing rather to the imagination than to the intellect, rather to the material than to the moral sense. There are perhaps a dozen of these devices, some of them apparently cabalistic or vaguely mysterious in character, distributed among the quarries with a certain Oriental irregularity, and carefully avoiding geometrical recurrences. These forms are in various shades of olive, brown, and buff, here and there accentuated capriciously with gold. Out of this complication results a very rich, quiet, and original effect, — an effect cunningly conceived and artfully executed, but legitimate and worthy of study by all decorators who know not how to be sober without being wearisome. It is really surprising to see

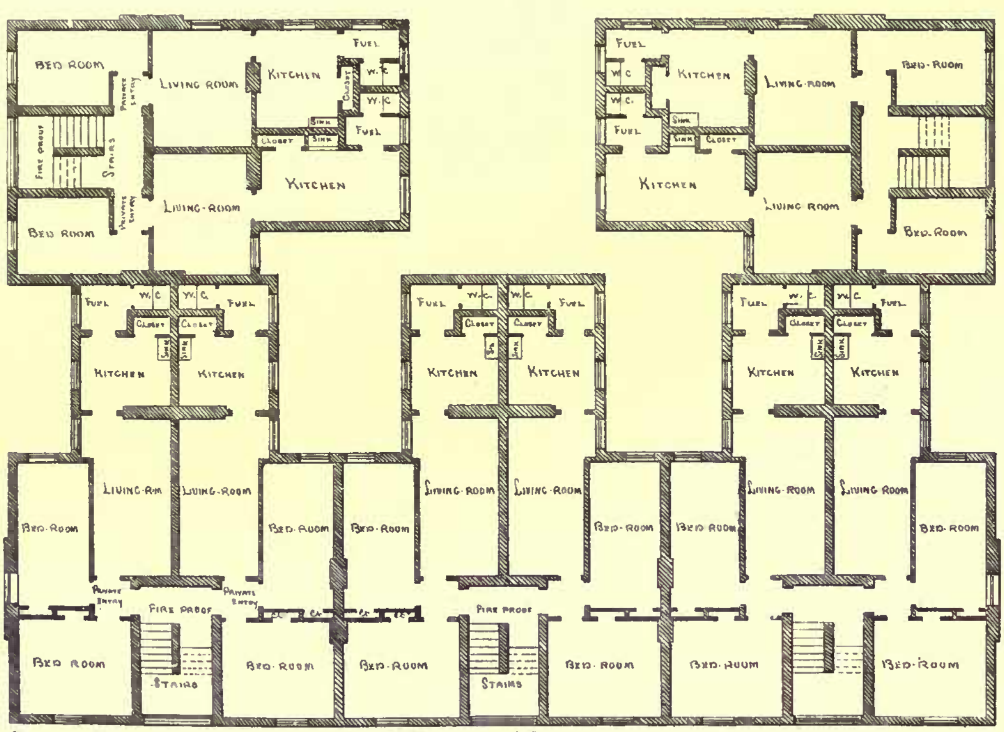


ELEVATION & PLAN

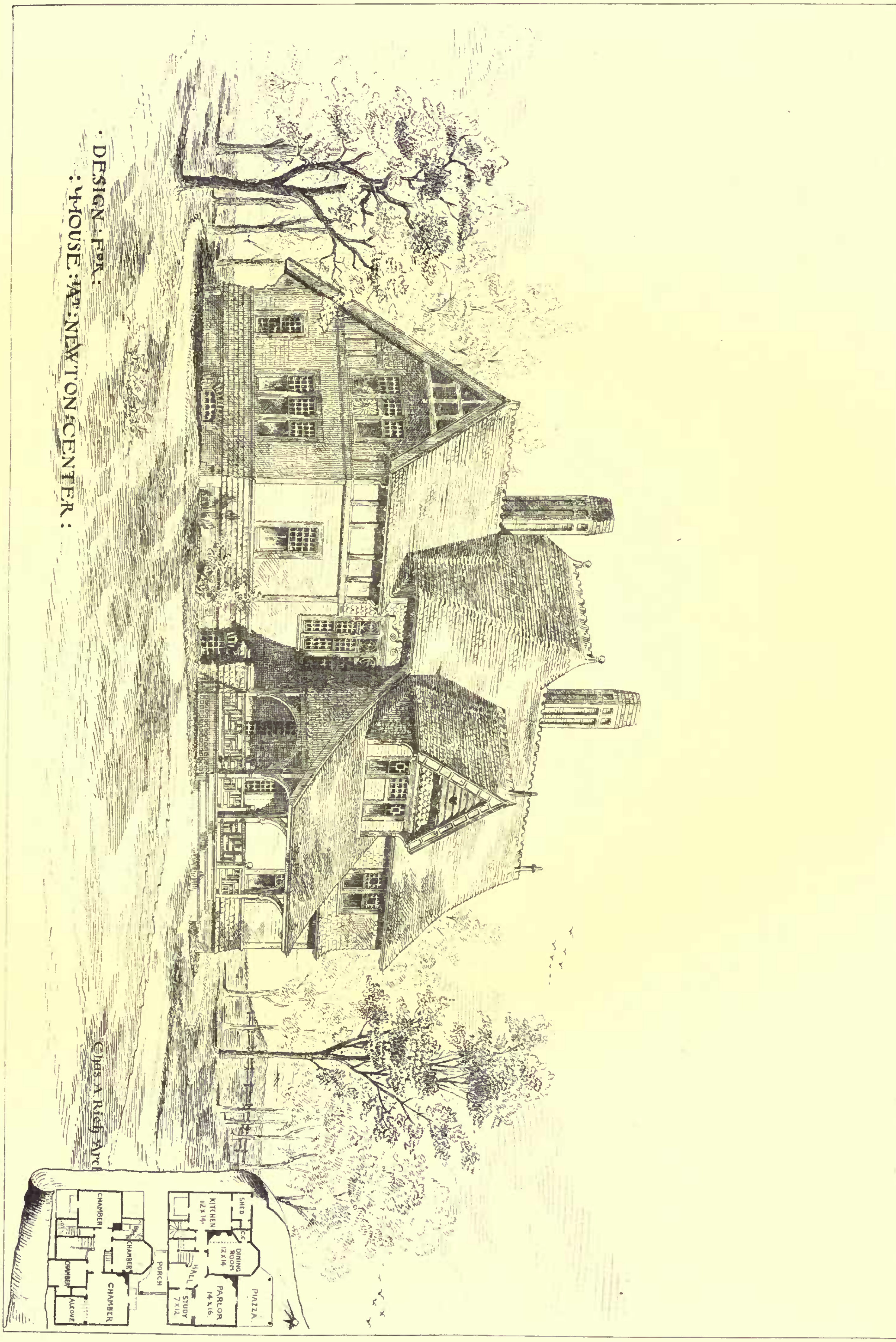
OF A PROPOSED TENEMENT BLOCK FOR THE MANCHESTER MILLS

MANCHESTER —— N.H.

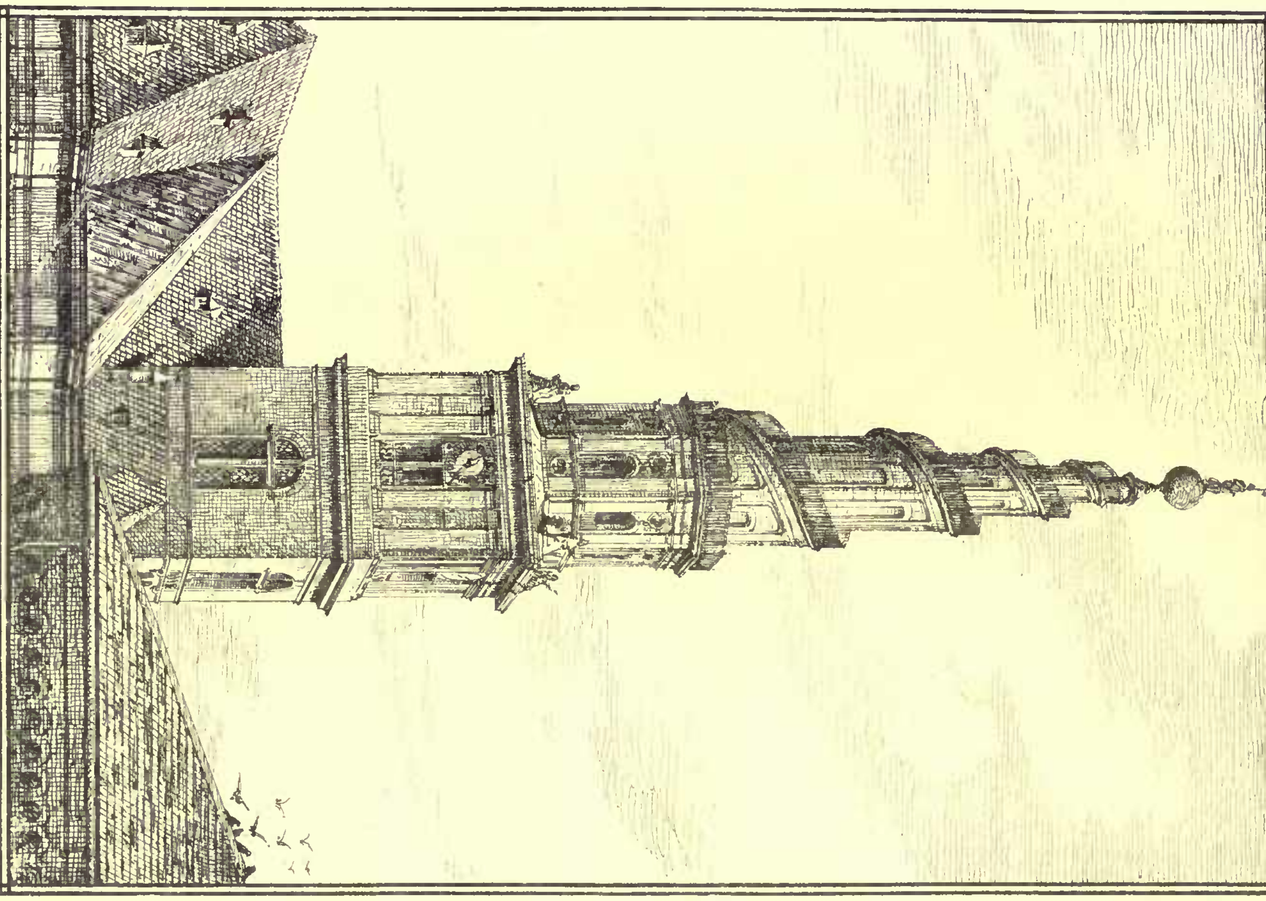
Geo Moffette jr.
Arch't
Boston



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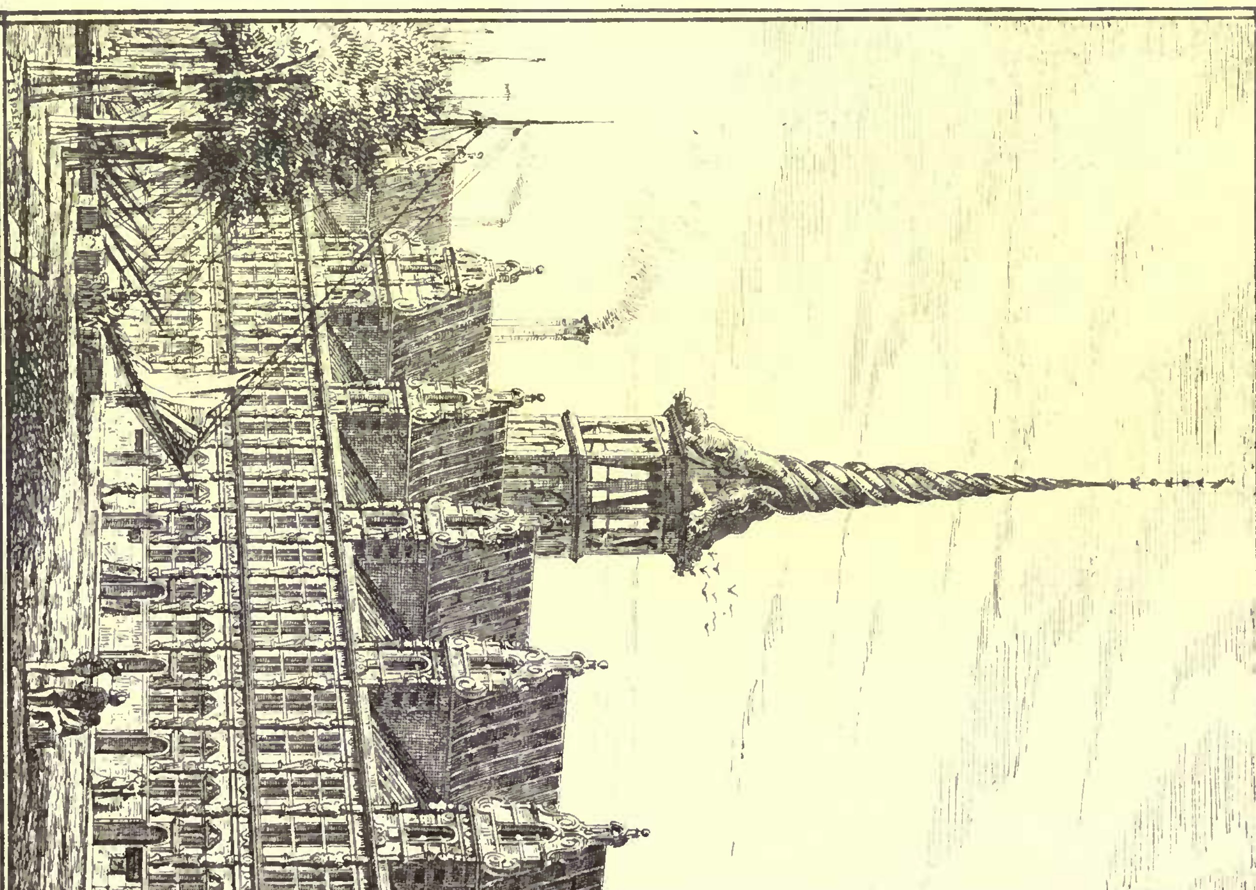


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"Church of Our Saviour" Copenhagen

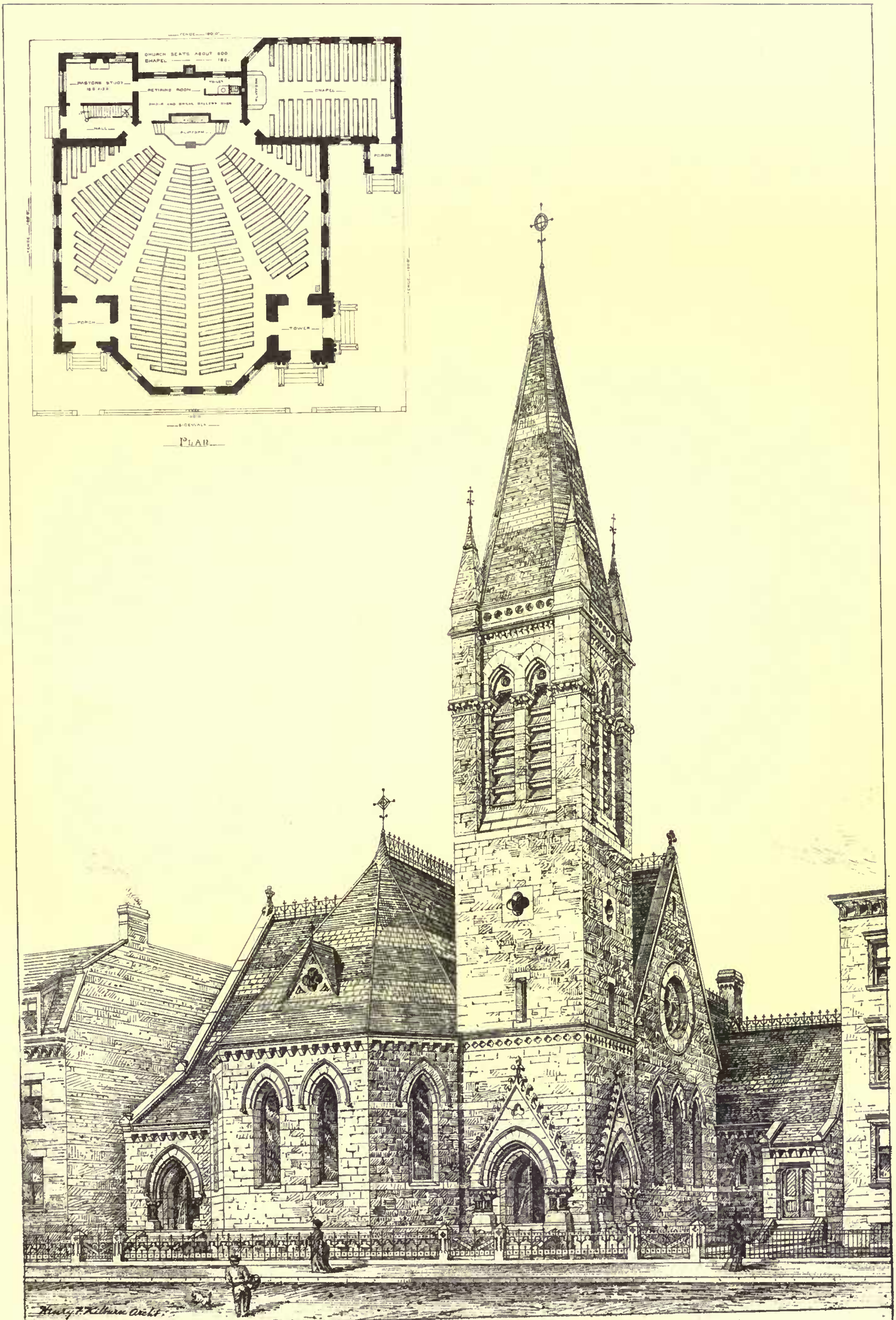
L. S. Ipsen



Merchants' Exchange Copenhagen Erected A.D. 1624

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DESIGN FOR FIRST PRESBYTERIAN CHURCH NORTH NEW YORK. HENRY F. KILBURN, ARCHT. 229 B'WAY. N.Y.

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with how many elements of color and form this serious result is achieved. It indicates a very intelligent study of Oriental methods. The same colors are used in the decoration of the four arches of the tower, so that their important representative function of support is not defined and recognized with that force and dignity which the circumstances require; but the four great grouped piers at the angles of the intersection of nave, transepts, and chancel have received a treatment in dark bronze-green, — very broad and simple, with gilded capitals and bases, — an arrangement remarkable alike for its reserve and its strength, and for its harmony with the prevailing tones around. The cornice, which forms the important line of demarcation between the dull red of the walls and the dark green of the ceiling, is weak and insufficient, and it encounters the mouldings of the capitals of the great piers in a manner which would be called artless and innocent if this were the work of an architect of the twelfth century, but which under the present circumstances must be considered careless or defiant. As regards color, which might have been so bestowed as to condone these faults of weakness and insufficiency in the cornice, it rather enhances them by emphasizing and separating its unfortunate details.

The decoration of the walls of the nave, so far as it has been developed, is conceived in an independent and original spirit, with the result of a very rich surface effect. It is mostly confined to the clerestory wall over the aisle arches, and is composed of a belt under the cornice and on a line with the impost of the windows, with painted pilasters of various device between the windows, inclosing spaces which in two cases are occupied by pictorial subjects, and in others by an enrichment of diapers. The architectural *motifs* of this decoration are Italian in character, very freely treated, and the belts and pilasters are embellished with Raphaelesque scrolls, and foliage, conventionalized in the Italian manner, with variations of green and rose colors. Portions of the background behind the pilasters are treated with patterns and colors borrowed from Oriental carpets. The amount of design lavished upon the detail of this part of the work, the absence of repetitions and stencil-work, the disregard of the non-essentials of symmetry, the multiplicity of parts with the general effect, however, of sober richness and repose, — all these characteristics combine to render this work a remarkable departure from the perfunctory and more or less mechanical styles of surface enrichment to which we have been accustomed. The very imperfections of execution and design, — such, especially, as are shown in a want of decision in the treatment of the architectural *motifs* employed, — and the numerous offences against the conventionalities of decoration, give to these walls a certain charm of individuality, for the prime result of a harmonious and jewelled enrichment of color is obtained, and the quality of this harmony of color is just such as could have been obtained by no mechanical methods. As compared with the best sort of modern conventional surface decoration, with its accuracy of craftsmanship and its precision of method, this is remarkable for the evidence it contains not only of the personality of the artist, as exhibited in his manner of thought and study, but of his characteristics of manipulation, such as never could have been delegated to artisans or handicraftsmen, however skilled and sympathetic, unless under his immediate supervision.

The two pictorial subjects — one Our Saviour and the Woman of Samaria at the Well, and the other Our Saviour with Mary Magdalene, — are treated in an academical manner, with great solemnity of feeling in line and color, and with all the restraint and reserve which comes of respect for consecrated types. In this regard they exhibit a curious contrast to the *naïveté* and independence of precedent exhibited in their more conventional surroundings. These compositions have light, shade, shadows, and perspective, and as such are an offence to the higher æsthetics, which do not recognize as correct any wall decorations which are not flat. But the purist could hardly find it in his heart to blame a fault which is condoned by the fact that there is no distance to the pictures, the figures being defined against a screen surface or wall in each case, — by the fact that they make no marked spot on the wall, and that they form an integral and not an exceptional part of the general scheme of color.

The details of the decorations in the tower, which, as we have said, is open from the area of the auditorium to the height of one hundred feet, where it has a flat, green ceiling divided into caissons or panels by crossing beams, are on a much larger scale, as is befitting their greater distance from the eye. There are three round-arched windows in each wall of this tower, resting upon a moulded string-course, perhaps ten feet above the crowns of the four supporting arches. It is thus, as it were, a box filled with light. It is pervaded by the dull red tone of the walls, and upon this background has been placed a profuse enrichment, which in line and color borrows much from the works of the pupils of Raphael, belts and panels being disposed according to the architectural opportunities very much as they would have disposed them. But in parts, notably above the crown of the great arches, there is a certain boldness of contradiction between the lines of the square panels and those of the archivolt which recalls the decorative methods of the Japanese. But if there are parts which remind one of the work of Giotto at Assisi, of the altar screens of Fra Angelico, of the Stanze of the Vatican, or the panels of the Villa Madama, there is still more which could have been thought and done only by a scholarly painter of the nineteenth century. Much of the detail is invisible from below, especially the studied Raphaelesques in the tympana of the tower windows; but one can see that the panels in the corner piers of the window-stage are filled with the emblematical creatures of the evangelists, — the lion of St. Mark, the eagle of St. John, and so on, ramping or perching upon curious conventional frets, scrolls, or diapers; and one can read written upon the belt of gold under the windows the solemn inscription: "Blessing, and Honour, and Glory, and Power, be unto Him that sitteth upon the Throne, and unto the Lamb forever and ever." The archivolt of the great arches is also marked by a broad golden belt, and the spandrels between are occupied in the upper parts by adoring angels leaning out of square windows, as it were, and by gigantic figures of apostles and prophets. The arrangement, as a whole, is not according to any old master exactly, as we have said; still less does it imitate any pagan or Oriental manner. But it has absorbed enough of all pertinent precedent to create an effect which belongs to the times in which we live. The red *fond* is never quite obliterated, and against it is projected a system of decoration which, though complex in motive and abounding in various color, is harmonious in general result.

The six great figures of prophets and apostles, although conceived with learning and with a marked degree of religious feeling, although suggesting a certain grandeur of sentiment, such as one who knows the prophets and sibyls on the pendentives of the Sixtine Chapel must needs have in mind when undertaking any similar scheme, are wanting in vigor and correctness of drawing. Their outlines are hesitating and indecisive, the hands are badly drawn, there is no human structure under the robes, they have no clearness or freshness of color, and in execution they seem crude and hasty; but they are by no means conventional or commonplace, as works much more correct than these might well be, and as decorative accessories they are large, bold, and effective. They are in harmony with the general scheme of color, and they add to the total effect a human interest of the very highest kind. But technically they furnish another and a very significant instance of the timidity and irresolution which the learned and conscientious artist of modern days is apt to exhibit in the presence of the august ideals which, by careful study, he has compacted out of the achievements of all the old masters. The execution lags far behind the intent. But better the serious aspiration and noble thought, though imperfectly set forth, than the dull perfection of the disciplined hand, otherwise uninformed and uninspired. "What we are all attempting to do with great labor," said Sir Joshua Reynolds, "Velasquez does *at once*." This remark is pregnant with suggestions of the inadequacy of modern art, under its common conditions, when called upon to do really great work. It explains not only the indirectness and indecision of the productions of the most thoughtful modern artists, but also the state of incompleteness in which they are compelled to leave much of their most ambitious work. Their process of composition, especially in work conceived upon a heroic scale, seems to be challenged at every step by a spirit out of the past. They are deprived of the virtue of simplicity, and the joy of their initiative is tempered with doubts.

As to the significance and interest of this remarkable example of interior decoration as a whole, there cannot be a moment's question. When the vacant red fields in the transept walls have been completed like the nave, when the empty hemicycle of the apse has been filled with its processional glories, and the whole interior thus brought to a condition of unity, it will be found that the experiment of bringing to bear upon our public monuments a higher form of art, such as that which made illustrious the Italian walls in the sixteenth century, is fully justified. But even in its present state of incompleteness, even as a record of curious tentative processes, more or less successful, in the art of decorating wall spaces, this effort, like every other bit of true art, is a point of departure for a new series of developments. It has in it a principle of life capable of indefinite expansion. It breaks away from traditions of mere craftsmanship, and opens for the artist a new field of learning, experience, and poetic feeling. It shows to what noble uses he may put the resources of his memory and invention. It encourages the study of great examples. It suggests, moreover, how the decoration of the simpler wall surfaces in domestic work may be rescued from the hands of the mechanical painter, and how, by a judicious bestowal of thought upon details, a more subtle adjustment of colors, a more intelligent recognition of its capacities, it may be developed into a work of art. — *Henry Van Brunt, in the Atlantic Monthly.*

CORRESPONDENCE.

DOMESTIC ARCHITECTURE. — MODERN BUILDINGS.

II. CAIRO, 1879.

As might be inferred, this delicate Eastern style adapts itself with peculiar charm to domestic architecture. Strangely enough, in spite of the luxury and splendor of the Khalifs, neither of civil nor palatial buildings could I find any important remains here. Undoubtedly much light wood-work was employed in their construction, but the destruction of this hardly accounts for the disappearance of such buildings, seeing that many beautiful private houses, dating from the fourteenth century down, are in perfect preservation. Unfortunately the difficulty of penetrating into the Arab houses, in view of the rigid privacy which the harem system requires, prevents a satisfactory study of them. However, their general characteristics vary but little. The street façades of the handsomest houses give no indication to

distinguish them from meaner ones. Even a passing glimpse into their court-yards is carefully precluded by making the entrances at an angle. Originally this fear of prying eyes came from superstition of the evil or covetous eye, but now it is chiefly due to the desire of escaping the greedy eye of the tax-gatherer, as even he cannot penetrate into the secrets of a house. Thus while a wealthy Arab will load his wives with rich jewelry, and fill his house and courtyard with luxury, he will encourage his street front to look as shabby as may be. The typical house of a well-to-do Arab is built about a court-yard with its well and trees and arbor, in which visitors are received in summer. Near the entrance is a large reception room, the middle of which is paved and contains a fountain. The sides are raised on steps, carpeted and furnished with divans. Inlaid cupboards containing faïence or plate are here and there set into the tile-covered walls, while the ceilings are richly painted and gilded in arabesques. A loggia and a guest chamber occupy other sides of the court. The harem is on the second floor and has a handsome hall, the central portion of which has a lattice-work lantern or small dome above the fountain. Its decoration resembles that of the reception room below, but is richer. The master's apartments are also on the second story. A characteristic feature of the harem are the lattice bow-windows, projecting into the court and street. The need to afford air and amusement to the women, without allowing them to be seen from below, has developed these lattice windows into the most charming features. Not only are their outlines most light and graceful, but the lattice-work is of astonishing intricacy and variety. All the resources of the turning-lathe — with which the Arabs are adepts — are brought into play, and the whole design within and without is charming. Although the houses everywhere and on all sides bear these airy oriels with only slight variations in the design, one never wearies of them. It is astonishing that to meet the marked American taste for bay-windows, no hints, as far as I know, have been drawn from these examples. The use of these delicate lattices, with their small cage-door openings, could not fail in boudoirs and chambers to be an improvement on that ugly *bête-noir* of the architect, — shutters with slats. There is another characteristic by which we might relieve our designs of the eternal repetitions of Roman scroll and vine-leaf patterns. As the Koran forbids the imitation of living objects, and above all, of the human form, its disciples threw their whole art into geometrical designs, and developed from the Grecian fret a series of most beautiful and intricate running ornaments, and panel patterns. And greater attention to such geometrical designs will the better repay us, because few of our stone-cutters, or even decorators, have the skilful touch which scroll foliage requires, while the architect having once worked out his pattern, however complicated it may be, a little care and a ruler cannot fail to perfectly reproduce it. A walk through the streets, where the sombre high walls are pierced with but few windows, shows the richness which even so sober an ornament as a geometrical pattern gives, when rightly placed; for nearly all decoration is reserved for the doorways, which, as generally in the East, are, to our notions, curiously small. The latter have generally a flat segmental arch — often also square-headed — with deep narrow key-stones, but when a lintel is used it invariably has a discharging-arch above it. It is upon this arch and lintel that the decoration is concentrated, and though in itself sober enough, the relative effect is extremely elegant and refined. The mosque doors are generally within niches whose *conques* have always pointed arches, and often pointed trefoils. It is in adjusting these trefoil openings to square niches — they are nearly always square — that some of the most beautiful and ingenious prismatic and stalactite corbelling is found.

We are in the habit of considering window tracery as an exclusively Gothic feature, but as early as the eighth century, in the mosque Ibu Touloun, where are the pointed arches of which I have already spoken, the most intricate geometric tracery is used. The interstices are filled with colored glass, but, as is natural in a hot climate, the glass is made subordinate, and the eye follows rather the slender dark lines of the tracery. This is always formed of hard cement set into wooden frames. As the style developed, the geometrical lines gave way to flamboyant patterns, generally representing flowers. There is thus an analogy to the changes in Gothic tracery, — which, however, only shows how the human mind follows the same series of developments. In the private houses the upper panes alone of the windows are filled with this delicate tracery.

Modern Egyptian architecture may be said to have not yet seen the light. The many new buildings in Cairo were built by German and French architects in a more or less vulgar Renaissance style — with few exceptions. The Khedive's great palaces are remarkable for bad construction and bad design. There is, however, one large mosque being slowly built opposite the great Sultan Hassan mosque, and in spite of so splendid a neighbor, so far as it is built, it is a worthy rival of that time-honored building. It offers a striking example of an Eastern characteristic, this new mosque slowly rising opposite a grander building which is fast going to ruin. The Egyptians have not the slightest idea of preserving or even restoring time-worn monuments. And the English party, which cries down repairs to buildings, may learn something by watching their policy in full operation here. In a few years there will be left but the crumbling walls of their finest old mosques, whose splendid color decoration is now barely visible, and disappearing month by month. There are however three modern villas in Cairo in which, as brands from the burning, valuable relics and faithful copies of characteristic Arabian features are preserved. These buildings show how perfectly this most refined of styles can be applied to dwellings of to-day — in the same climate, of course. Two of them are by M. Baudry, brother of the famous painter in Paris. In one, which he built for himself, he has introduced the whole of a splendid old ceiling, with its palm beams and panels exquisitely decorated. The furniture is designed to correspond with the style, and the result is as comfortable as it certainly is Eastern. Another house he has built for a wealthy banker is the ideal of an Arabian dwelling. A marble arcade with widely projecting roof, as in some mosques, precedes a vestibule with columns and open arches, like some at Cordova. This is light and airy, and the change into twilight of the great *salon* beyond is startling. In front, at the end of the room, is a great niche with a horseshoe arch; within this, raised half a dozen steps, is a luxurious divan, on which, from a great window shaded with the lattice work and tracery of which I have spoken, falls a rich subdued light. The walls have slightly-relieved arabesques and geometrical panels delicately colored. Pearl-inlaid shelves and cabinets are against the walls; broad divans and rare rugs cover the floor with rich tints. The ceiling shows the palm beams as in the examples of the fourteenth century, and in the middle a beautiful little dome or lantern glows with bright tints. The effect is dream-like and takes one out of the nineteenth century. M. Gouron-Boisvert, another French architect, has nearly finished a larger and equally beautiful house for the Count de St. Maurice, an amateur who has the finest collection of Arabian art.

Space fails me to describe more minutely these buildings, or to enter upon a discussion of the Arabian decoration, which, from the almost unrivalled perfection to which it was carried, deserves our close attention. We know much more of a less pure style, that of the Moors in Spain, than of this the fountain source. The best works on this architecture and its decoration are Les Monuments du Caire, by Coste, Prisse d'Avennes's fine work, and Bourgoin's Décoration Arabe, to which he has a sequel now in press. All these works were published naturally in France, for it is to her exertions for many years past, that not only many monuments now destroyed were drawn and described, but that the Khedive himself has learned something of the artistic value of these monuments. These exertions have also produced at an enormous cost one of the most exhaustive works of modern times. No country by a single effort was probably ever so perfectly described and illustrated as was Egypt by the French commission which was charged with laying before the world the condition and resources of this then neglected land. R.

THE ALLEMANIA CLUB-HOUSE. — THE CHANCERY CHAMBERS.

CINCINNATI, O.

THE Allemania Club-House, corner of Fourth Street and Central Avenue, was dedicated to the worship of the deities of pleasure, on the evening of May 1. The building was designed by Mr. J. W. McLaughlin, a fact which speaks for itself, since the building bears upon every wall the handwriting of this architect. The façades of Ohio freestone are plain and bare, and hardly present the home-like aspect and cheerfulness that one would expect to find in a club-house. The Queen City Club-House, built by Messrs. Hannaford & Procter, has a great deal more of the domestic look. However, the straight and severe lines of the former building may be accounted for by the facts that the Central Avenue front of the first story is devoted to stores, and that the wants of the society required a large hall in the third story for theatrical performances, neither of which features are in the Queen City Club-House. The windows of the second story outside have a sort of a double cap, which can claim originality of design if not approbation; it is peculiar, and one hardly knows whether he likes it or not.

The third-story windows are double, with a circular opening above filled with colored glass, the whole united as one by a pointed arch, giving the building a Florentine appearance. Under these windows is a band course broken with "check blocks;" of what use these are it is difficult to imagine, unless perchance the architect intended that they should check some of the soot that falls so copiously in our city, and then with the descending rains give the building an architectural streak of many feet in length. Already on each side of each "check" may be seen the evidence of this.

A stone oriel window projects from the second story, and perhaps is one of the good features of the design.

The interior arrangement gave entire satisfaction to the "Allemania," else why should they have presented Mr. McLaughlin, as they did on the opening night, a silver service?

The "Chancery Chambers" to be erected by Wm. Hooper, Esq., at the corner of Vine and Baker Streets, is to be an out-and-out Queen Anne building. The lot is one an architect rarely meets with, having light on all sides, and is fifty feet on Vine Street by ninety feet on Baker Street. Stores will occupy the first story, and, as the name of the building indicates, the upper rooms will probably be occupied by lawyers. There will be six stories above the street. The façades will be a combination of pressed brick and freestone. The design shows three bay-windows, two stories high above the first story, all of which are partly recessed from, and will partly project beyond, the street line. The central bay-window is octagonal and the side ones

are square-faced, with rounded corners. The sashes of all the windows are divided into three heights, the upper being small and filled with stained glass.

This is the first Queen Anne building to be built here, and has apparently received at the hands of the architect, Mr. Samuel Hannaford, careful study. The plan provides for eight rooms on each floor (which are reached by a freight and passenger elevator and a stairway), abundantly lighted. The building will be heated by steam and each room will have in addition a fireplace. The construction is to be fire-proof throughout, and the cost, although not stated, will certainly reach $80,000.

The question as to whether the Shillito establishment would drag business from its accustomed haunts to what is known as "up town" seems to be settled in the affirmative, for we notice several dwellings turned into stores in this locality. The Messrs. Emery are tearing down a building on the corner of Race and George Streets (directly opposite Shillito's), with the intention of putting up a new one, and, as they always build well, we look for something satisfactory.

As has been stated before in these columns the only means of knowing what amount of building is done here is the building permits issued by the Board of Public Works. The supposition is that when a building goes up a permit is taken out and the cost of the improvement stated therein. But the truth is that permits are *not* always taken out, and seldom or never is the right cost given. We shall, however, have to go by this until something better is provided. The permits issued this year up to the 8th of May are, for repair, 152, at a cost of $46,924; for new buildings, 132 permits, at a cost of $736,476. Total permits, 284. Total cost, $783,400. For the same period last year there were issued 290 permits, with a total cost of $630,265. C.

WHY BUILDINGS ARE NOT MADE FIRE-PROOF.

BOSTON, May 12, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — I suppose that most of your professional subscribers have, like me, read E. A.'s letter, published in your last issue, with great interest, and also with no small pleasure, although we may think that his remarks about architects and their work convey an impression, the injustice of which we feel the more keenly, because the writer's intention so evidently is to show them fairness and courtesy. E. A. says he is surprised that the owners of dwellings, churches, warehouses, etc., after the lesson of the great fire, have not required their architects to adopt the same methods of construction and modes of preventing loss by fire that are so successful in factories. So are we, and our surprise is as much greater than E. A.'s as our knowledge of the simplicity of the means by which comparative security can be attained is, with all due respect to him, greater than that of a non-professional is likely to be.

But E. A. goes on to speak of the combustible character of stores, hotels, churches, etc., as usually built, and concludes with the following defective piece of logic, that "if it is more hazardous to insure stone churches or brick hotels than cotton factories, it is time to question the capacity of the architects who constructed them." To make this reasonable, the premise must be supplied that the architects controlled the mode of construction. In how many cases is this true? Does E. A. suppose that any decent architect does not know how to build a building with any required degree of fire-proof quality, if he is instructed, or rather permitted, to do so? Or did he ever see an architect who, in discussing a project for a new structure, did not timidly suggest modes of obtaining greater security against fire than was possible with the ordinary construction? I know of no habit more invariable with any class of people than is that among architects of trying to suggest such improvements on the ordinary fashions, unless it be the corresponding habit among their clients, or patrons, of summarily crushing such aspirations. And we, perhaps, have had occasion to think even more deeply on the subject than E. A., and have seen that the owners are, from their point of view, right. Let us present to E. A. an example. Suppose he has in mind to build a hotel, to cost a hundred thousand dollars if built in the ordinary manner, which, it must be remembered, is also the cheapest manner. His architect, who keeps all these figures at his fingers' ends in the vain hope that some time they may be of use to him, tells him that at the present price of iron he can make it practically fire-proof for about 18 to 20 per cent increase in the cost. E. A. thinks other people are foolish not to make the additional outlay: how would he figure in his own case? "If I build it fire-proof," he would think, "I shall need no insurance. With the ordinary construction the premium will be about one per cent for five years, or $200 per year. To make it fire-proof will cost say $20,000 more. Interest on $20,000 at six per cent is $1200. I was then," he would remark to himself, with considerable asperity, "about to sacrifice a thousand dollars a year to a mere sentiment, or in order to gratify the whims of this architect." The agent tells him that he could not get any more rent on account of the fire-proof qualities of his building, and the welfare of humanity in general and the initiation of better modes of construction are left for the next man to take care of.

Every architect knows that this is true; have not underwriters yet found it out? People will not build securely, simply because it is not for their interest to do so. Now and then parties who carry valuable stocks of merchandise can figure out a profit in building a fire-proof structure to contain them; or where, as in the case of the manufacturers' mutual insurance companies, the influence and interest of a great number are combined to impose precautions upon a single member, a certain amount of security is enforced; but except under such circumstances, all architects will unite in saying that it is next to impossible to induce owners to expend money in extra protection against fire.

The writer, in a youthful enthusiasm for good construction, finding that at least half of the fires in frame houses could be prevented by building the chimney walls eight inches thick instead of four, began by drawing all his chimneys in this way, hoping that some one, seeing it done, might approve his intention, or might overlook it, and thus without his consent be saved from burning alive. It was of no use; the plans would be submitted to a builder, and brought back with the invariable question, "Why do you make these chimneys so thick?" "Oh, that is for protection against fire." "How much will it cost more than the common way?" "About a hundred dollars." "Is it often done so?" "Well, no; but if it were, scores of children who have been burnt in their beds would now be"— "Never mind about that, the ordinary way is good enough for me; please have the plans changed." After repeated experiences of this kind, he contented himself with suggesting the extra thickness of the flue walls as extremely desirable, but to this day he has never found an owner who would consent to have it done, unless he were compelled by law.

Most of us, after we have had a few of our clients leave us because "they did n't want the architect's ideas crammed down their throats," get shy of preaching unpopular doctrines, and content ourselves with looking after our four-inch walls as well as we can. It is all we are allowed to do, and I claim that we do it well. Most persons know that a house designed and superintended by a competent architect is far less likely to burn than the ordinary carpenter's construction. They are both restricted to the same materials and modes of building, but to the superior care and knowledge of the architect is due the increased security that he attains.

It is strange that any one should lay at the door of architects the reckless fashions of building. Where alone is there any attempt to impose some conditions of safety? In the large cities, by the help of building laws, all of which have been proposed, drawn up, urged to enactment against bitter opposition, and carried to enforcement, by the efforts of architects. What more can they do? If anything further in that direction is to be accomplished, they must have the assistance of some other influential class. Why should not the underwriters themselves help them, instead of abusing them?

E. A. comments upon the failure of architects to design factories which were suitable in all respects for their purpose. There is nothing surprising in that. Judging from the results, the architects employed to design factories are seldom of the first class, and the best would need much help from the mill engineers in their first attempt at such constructions, but it does not follow that with the aid either of their own or others' experience they would not be able to be of much use to the owners of the mills. Nor must it be forgotten that a building cannot be made beautiful without some sacrifice of money or convenience. A mill may be perfectly convenient and perfectly beautiful, but cannot at the same time be perfectly economical. A poor architect may be unsuccessful with ample means, just as a second-rate tailor can use a bale of cloth without making a well-fitting coat; but the best tailor cannot make a coat elegant which reaches only two inches under the arms, nor can any architect make a rectangular box with a flat roof picturesque, whatever directors may think. C.

EFFECT OF ALTITUDE ON VERTICAL DIMENSIONS.

KEOKUK, IOWA, May 10, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — In my communication printed in your issue of April 26, there is a transposition of a part of a sentence which makes the reading incorrect. The sentence referred to should read thus, "Whereas 10° of visual angle at an angular altitude between 35° and 45°, and subtending an apparent height or rather chord of 88 feet, would correspond to 150 feet of real vertical height." To be more exact, however, I may here explain that the 88 feet is tangent of 10° visual angle at an angular altitude of 10°, and radius of 500 feet. But the chord subtending 10° visual angle at any angular altitude, and 500 feet radius, is 87 $\frac{3}{20}$ feet, while the difference between the chord of the visual angle and the tangent of angular altitude increases with the angular altitude. To amplify the application of this simple method, which is more exact than the graphic method, in dealing with a structure of such height as the proposed Washington Monument, reverse the operation and find the apparent vertical height of 88 feet real height at angular altitude of 35° and 500 feet horizontal distance, thus: Take tan. 35° = 70021. Then tan. 35° × 500 = 70021 × 500 = 350, which is the height that subtends the angle of 35°. To this add 88 feet, and we have 438 feet for the whole height. Dividing by radius we get $\frac{438}{500}$ = .876, which is the tangent by table (nearly) of 41° 13′, the whole visual angle. Subtracting 35° we have 41 13′ — 35° = 6° 13′. This is the visual angle subtended by the 88 feet. Its chord, multiplying by the radius, is .1085 × 500 = 54¼ feet, so that 88 feet in real vertical height at 35° angular altitude, and at 500 feet horizontal distance, would only appear to be 54¼ feet, being the length of chord subtending a visual angle of 6° 13′, at 500 feet radius or distance from the eye.

My intention was more particularly to give a mere abstract illustration in a somewhat generalized form of an effect of angular altitudes on visual vertical dimensions, with especial reference to such an exceptionally high object as the proposed Washington Monument. I did not allude to the almost self-evident corrections necessary to obtain the exact dimensions, etc., of any particular part of a structure in position at their respective altitudes or actual distances from the eye in an elevation, as for instance, to find the actual distance of any part of an elevation from the eye, say at 35° angular altitude and 500 feet horizontal distance, find (in tables) the secant of 35° = 1.2208, which × 500 feet = 610$\frac{4}{10}$ feet — its actual distance (in an air-line) from the eye. Yours respectfully, ALEX. BLACK.

NOTES OF EXPERIENCE AND INEXPERIENCE.

23. RED MORTAR. — I would like to know what is used in red mortar for a fine front of pressed brick. Many of the reds fade out light and are not permanent. Also the best method of producing stamped patterns on plaster surfaces for exterior decoration. The chief trouble is to get a clear, sharp impression without breaking the edges. We are utterly at a loss as to the *modus operandi*. "QUEEN ANNE."

NOTES AND CLIPPINGS.

STRIKES. — The past winter in Cincinnati was one of great severity, and in an unusual manner delayed the opening of the building business this season. In consequence of this fact a great deal of work is now being pushed forward, which has given the impression that a great deal of building is doing. That this state of affairs is not healthy is evidenced in the fact that the hod-carriers have already struck for higher wages, and the entire building market is in a state of excitement and expectancy, for no one knows just what to look for next. There are rumors that the brick-masons, plasterers, and others will soon follow the example set by the laborers. So far, however, work has not been stopped, as the bosses have imported from the surrounding cities negro helpers, and these have not been molested. It is estimated that two hundred laborers, or about half the number employed in busy seasons, are now on a strike.

A NEW ARCHITECTURAL ASSOCIATION. — The architects of the District organized, on May 15, the "Washington Architects' Association" for mutual consultation and benefit.

THE DISCOVERIES IN THE FARNESINA GARDENS, ROME. — North of the docks we have met with the remains of one of the noblest private palaces of the time of Augustus. The date can be reckoned from the absence of bricks on the walls, which are of reticulated work, like the Muro Tosto and the house of Germanicus on the Palatine. I hope the reader will trust not my own judgment, but that of the best archæologists who have seen the place, and who unanimously declare that it contains the finest and most perfect paintings ever discovered in the Roman world. The room which contains the paintings is thirteen feet long, seven feet wide, and eight feet high; it communicates with the other apartments by two doors, three feet wide, leaving a painted surface of two hundred and seventy-two square feet, each inch being a perfect wonder of art. The surface is divided into compartments by pilasters and polychrome columns, etc. Near the frieze the artist designed pictures hung to the wall, with their folding shutters: some wide open, some half closed. The pictures represent different scenes, such as a declamation school, a wedding, a banquet, etc. The figures are four inches long, but so wonderfully executed that the very eyebrows are discernible. The purity of design, the strength and harmony of coloring, and the excellent preservation of the whole exceed belief. In the centre of the walls there are larger pictures, but as yet only one is uncovered. It represents two females, one sitting and one standing, and both looking at a winged love. The figures are designed in outline with dark, subtile color, each space within the outline being afterwards filled up with the proper tint. The winged love is only drawn in outline, and left unfinished. The ceiling of the room has fallen inside, so that we hope to recover almost all its ornamentation. It was covered with bas-reliefs in marble-stucco, worthy of the paintings. The reliefs are very flat, so that the most prominent points stand out not more than three millimetres. The artist might have modelled the different scenes by breathing over the stucco, so light, so gentle, and yet so vivid they are. From the fragments already recovered it appears that the ceiling was almost flat, and divided into squares, lozenges, etc. The most perfect scene represents the borders of the river, or a small pool, with villas, temples, shrines, huts scattered under the shade of palm or sycamore trees, and weeds of various descriptions. Their foliage is waving gently with the breeze. People are very busy around. Some are fishing with the rod, some bathing, some carrying water-jars on the head. The fragments already put together are one hundred and twenty. We might well repeat, "Nom v'e' rosa sensa spine." Had this exquisite cabinet been found in a decent place, we should have tried to remove it entire, walls, painting, pavement and all. But it was our fate to find it under water! When I first ran to the spot, not more than one foot of the walls was above the water. It was necessary to dig an outlet four hundred feet long, ten feet deep, between the house and the Tiber. This had scarcely been completed after a hard night and day of work when Father Tiber honored the paintings with a most unnecessary call. Finally he retired to his bed, and I feel sanguine that this evening we shall reach the pavement of the room. If the pavement corresponds to the walls and ceiling, it must be glorious. The work of drainage led to the discovery of some larger apartments. One hall is sixty-six feet long and nineteen feet wide; the paintings represent a colonnade of green marble with gilt capitals. Between the columns are small pictures, about two feet square, with figures sacrificing or otherwise engaged in domestic duties; the ground is blue. Nearer to the pavement rises another band of frescoes on a black ground. The frieze is supported by winged caryatides. This seems the work of an inferior hand. We have summoned the cleverest artists from Rome and Naples to remove at once the frescoes, as their exposure to the air after so many centuries of submersion makes the coloring fade very quickly. — *The Athenæum.*

M. VAUDREMER. — We are pleased to learn that M. Émile Vaudremer has been elected to fill the chair in the Académie des Beaux-Arts left vacant by the death of M. Duc.

A TRIPTYCH BY QUENTIN MATSYS. — The great triptych by Quentin Matsys in the Church of St. Peter at Louvain, one of the Flemish master's most important works, has lately been the subject of vehement controversy. This ancient altar-piece, which represents the Virgin and Child in the centre, and scenes from the life of her mother, St. Anne, in the wings, was painted by Matsys for the fraternity of St. Anne of Louvain, and bears the inscription, "Quinte Metsys screef dees a° 1509." It was carried off to Paris in the time of Napoleon I., but was restored with other art treasures to Belgium in 1815, and has hung ever since in the chapel of St. Corneille in the Church of St. Peter. Lately, however, the Belgian Government has offered the authorities of this church the sum of $200,000 to give it up, in order, we suppose, that it may be placed in the National Museum, where it would be better seen and taken care of than in a dark old church. But although the church was willing, in consideration of this large sum of money, to part with its treasure, the town was not; and a great dissension arose, the town council wishing on their part to buy it and place it in their hôtel de ville. This last measure has at length been adopted, the town paying to the church an annual *rente* of 10,000 francs in consideration of this alienation of its property. — *The Academy.*

NEW ORLEANS AND THE YELLOW FEVER. — The Auxiliary Sanitary Association has abated the nuisance of Locust Grove Cemetery, New Orleans, by a covering of two feet of earth, sown with grain and grass. All interments are now made in a new cemetery, three and a half miles from the city. The dumping grounds have been covered with a coating of lime a foot deep.

A NEW ELECTRIC CANDLE. — A new electric candle has been brought out in San Francisco which is said to be an improvement upon both the Jablochkoff and Werdemann candles. The Jablochkoff candle consists of two sticks of carbon, separated by an insulator, at the apex of which the current of electricity passes from one stick to the other, thus forming an arch and igniting both carbons. The trouble with this candle is that it flickers badly, and on being extinguished cannot be relighted unless the carbons are connected for an instant with a conductor, and the circuit reëstablished. The Werdemann candle consists of a single upright stick of carbon, held firmly between two metal jaws, which form an arch for the passage of the electric current. The carbon is attached by means of little pulleys with small weights, which keep it constantly in the arch, and as it burns out raise it. Therefore when the electric current is shut off with a local switch no other candle in the circuit is affected, and the carbon may be relighted by turning on the current again. The Werdemann candle is defective in that the effect of the weights is fitful. When, for instance, the lighted carbon burns down to a point, the pressure of the weights breaks it off; the jerk that follows dims the light until the carbon gradually burns down again, when the operation is repeated. The new arrangement is constructed on the principle of this latter candle, but substitutes an automatic spring for the weights. This spring presses constantly upon the carbon, but so lightly that it does not break off the point. — *New York Tribune.*

THE WASHINGTON MONUMENT. — It is suggested by the Louisville *Courier-Journal*, that each voter in the next presidential election should contribute five cents towards building the Washington Monument, — a course which would net about $400,000. Before we are called on for our five cents we trust that a satisfactory design will have been accepted.

TENEMENT LIFE IN ANCIENT ROME. — A correspondent of the New York *Tribune* says: There were in the time of Theodorus over 46,000 of these *insulæ* to only 1,700 *domus* or private houses. The Roman *insula* received its name from being separated from all neighboring buildings by a distance of at least five feet. It was restricted in height to seventy feet, and its lower stories were built of fire-proof Sabian or Albanian stone. Within it was divided into numerous suites of rooms called *cœnacula.* It was in charge of a steward or agent whose sole function was to hand over the rents, amounting to from $15,000 to $20,000 for each house, to the fortunate and invisible proprietor. The same right of repairs and sanitary regulations characterized the administration that now characterizes that of his present successors, and destruction by fire perpetually menaced the tenant, who found no protection in the easily evaded laws. In witness of this we have the words of Juvenal: "We live in a city supported in great part by slender props, for thus does the steward keep the houses from falling, and covers the gaping of chinks. He bids us sleep secure in the midst of impending ruin. In the country there are no conflagrations, and no fears in the night; but here you are awakened by your neighbor calling for water and removing his goods. The third floor is already smoking and you know it not. Yet if fire begins below, the highest floor is doomed." The further miseries of close crowding are pathetically depicted: "Here, in Rome, many a sick man dies from lack of sleep, and from indigestion of the wretched food that sticks to his burning stomach. For who can sleep in hired lodgings? Only with great wealth can one sleep in this city. Drusius can never rest for the noise of carriages passing in the narrow streets and the oaths of the waiting carters." The confusion in the thoroughfares is also graphically set forth in the same essay: "In the streets below the crowd press against one. The first strikes you with his elbow, the next with a hard joist or a beam or a tub. Presently I am trodden on, and my legs are muddied, and a soldier's nail cuts my bleeding toes. The houses are so high that a pot falling crushes your skull and even splinters the stones of the pavement. You will be thought careless and foolhardy if you go out to supper without making your will, for there are in the street as many chances of death as there are open windows. Therefore you may lift up to heaven this miserable prayer, — that basins may be only emptied, not thrown on your head."

FALL OF SEA CLIFF. — More than four hundred yards in length of cliff at Conville, near Havre, recently fell suddenly into the sea, with a report like three successive thunder-claps.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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THE dedication of the Roman Catholic Cathedral of St. Patrick, in New York, on Sunday, was a noteworthy thing, for the cathedral, designed by Mr. Renwick, is by far the largest and costliest church that has ever been built in our country, or on this side the Atlantic, being much larger than the Cathedral of Montreal. For a detailed description and an illustration of it we will refer our readers to our number for January 5, 1878, only stopping to recall here some of its main points. It is planned on the model of the Gothic cathedral of the fourteenth century, having a nave and choir, transepts, aisles, apse, and lateral chapels. Its dimensions are not much less than those of a cathedral of the first class. The transverse section of the nave and aisles is indeed almost identical with that of the Cathedral of Chartres, the whole inside width being ninety-six feet, of which half belongs as usual to the nave, and the main vault one hundred and six feet high. It is shorter than Chartres, however, by one bay each in the nave and the choir, and narrower by one in each transept. In fact it suffers in general effect, as modern churches always do, from being rather short for its height, a fault which will not be lessened when its now unfinished spires are carried up to their intended height of three hundred and thirty feet. The peculiarity of its plan is that although the choir finishes with an apse, as in the French cathedrals, which shows in the clerestory, the line of the apse is lost in the lower story, not being carried out in the French fashion by a *chevet* of radiating chapels, nor even by an encircling aisle, but lost in a square termination as in an English church, the east wall being crowded in so as to leave a bare passage-way in the place of the usual ambulatory. This treatment, which is probably due to the small dimensions of the lot on which the Cathedral stands, detracts the more from its due length, and costs the building one of the characteristic beauties of outline which belong to its prototypes. Within, the church shows again the complete ordonnance of a Gothic cathedral of the fourteenth century, with an ample triforium-gallery and high clerestory, a range of chapels lining the aisles between the buttresses, and a simple *lierne* vaulting, if we remember rightly. Most of the windows are already glazed with French stained-glass, by Lorin of Chartres, in subjects from the Bible and from the lives of the saints. An elaborate reredos and altar are already in place. The Cathedral is said to give room for fourteen thousand persons sitting, or nineteen thousand standing, a capacity equalled as yet among us only in temporary "colosseums" or "tabernacles." The cost thus far is said to have been about four millions of dollars.

THIS building has been rather severely handled in a clever article in the February number of the *Atlantic Monthly* by Mr. Clarence Cook. His criticisms are justified in the main, and yet they do not give a fair impression of the building, or of its architect's part in it. We have pointed out some faults in the general design; there are others in the execution. The stone of which the church is built is inferior, as Mr. Cook says, and would impair the effect of almost any important design. There are a good many makeshifts and shams in the building, but we need not assume that they were contentedly accepted by the architect. The inner walls of the nave and aisles are not of natural stone, but of artificial stone, or *béton*; worse than this, the vault is of lath and plaster. But the *béton* lining of the wall is as good as brick, is a kind of brick, in fact, which we need not condemn, although we should much prefer to see it give place to stone. The plaster vault is unpardonable; but we may believe that the architect, who had counted on building an honest one of brick, was grieved in spirit when the authorities of the church forbade it, and stripped away the flying buttresses which he had provided to carry it, robbing his exterior of all its play of light and shadow. The detail of the architecture is not studied from what seem to us the best originals; it lacks spirit and refinement, and is often meagre; the glass of the windows ought to have been got from England, and not from France, though probably that would not have been permitted in a Roman Catholic church. But with all these shortcomings, it is well to remember that the undertaking is a grander one than we are used to seeing, and that some of the grandeur that belongs to it remains to it for all its faults. A painstaking reproduction, on an adequate scale, of a mediæval cathedral is a lesson not without value to those who are not familiar with the originals. From the interior, making allowance for its faults, but not forgetting them, we may get a fair impression of the effect and general character of a church of the first class. The proportions and lines are very good, the scale is noble, the grouping and arrangement are the real thing, the embodiment of the long experience of the Middle Ages. The Roman Catholic Church is the only body which would have dared attempt such a structure among us. Its authorities here are not educated, nor its means adequate, as yet, to the proper carrying out of such a conception. In fact, there is no association among us which could be expected to raise the funds to carry out such an undertaking with due thoroughness and completeness, when it is not to be looked on as a paying investment. It is beyond the reach of any but state finances. The Cathedral may have been built a generation too soon, or it might have been better to build it in a different form; but there is something to be learned from what we have got and something to be enjoyed in it.

THE interest of the Chicago Custom-House trial has abated with the discharge of the most prominent defendants, Messrs. Potter and Hill, and with the assurance, which the public may receive with confidence and thankfulness, that their responsible officers have been faithful to their trust. The case is now narrowed to the prosecution of the contractor and his confidential clerk, with the superintendents and one of the foremen, the other foreman, Mr. Wheaton, having been discharged with the supervising architects, as we mentioned last week. The words of the judge to the jury concerning the charge against Mr. Potter of collusion with the contractor were clear and decisive enough: "His actions and his words were not merely a remonstrance but consisted of active opposition [to the contractor], which was persisted in, in some respects, even after the rulings of his superior officers had been against him." And again: "The same, although it appears perhaps in a less degree, because the defendant Hill came into office at a later stage of the work upon this building, — the same, I think, appears with reference to that defendant." As for Mr. Wheaton, so far as we have seen, his name was not once brought forward in the evidence submitted by the prosecution. Of the probable success of the remaining prosecutions it is not proper as yet to express an opinion; but it is fair to say in view of these acquittals that, whatever may be the indications of the evidence, the presentment of the grand jury in itself has lost all weight. One who considers the extreme annoyance and inconvenience to which these gentlemen have been heedlessly put by their prosecution, — the interruption of business, the loss of money and of time, the slur upon their good name, the suspension, as a matter of official etiquette, of the Supervising Architect during five months, which have been the only fruit of their headlong indictment, — will not think that the leading counsel for the defence stretched his point very far when he declared that the indictment of his client, without the grand jury knowing whether he was in favor of the alleged wrongs or disapproved of them, but simply because he was an officer of the Government coming within the statute of limitations during the time when the work on the building was done, was an outrage.

THE further testimony submitted in the trial, so far as it has reached us, has gone to prove the unsatisfactory quality of much of the stone used in the building, and the excessive cost of cutting the upper (attic) story, — points which were pretty well es-

tablished before, — and to show, which it does clearly enough, by what system the cutting was made so good a thing for the men who did it and, by implication, for the contractor. Conflicting opinions were given as to whether the sawing of the stone was to the advantage of the Government or not; but no evidence was adduced to bring home any fraudulent intent to the officers of the Government. Indeed, one of the unexpected characteristics of the prosecution has been the absence of any attempts to prove direct collusion. The testimony of time-keepers and stone-cutters introduced by the defence justifies many of the accusations that were common when this matter was first made public, of idling, delaying work, and even absence, ball-playing, and the like, among the workmen. It was testified that Mr. Prussing, while superintendent, was at least indulgent to the men who were reported and docked or discharged for idleness, generally replacing them on the work for subsequent trial. On the other hand it was abundantly shown that he found fault with the slowness of the men, and that they were careful to keep a good look-out for Mr. Prussing's visits, and fall to work when word was passed that Big Square, as they nicknamed him, was coming. The habit of soldiering, indeed, was, as the building went on, developed into a careful system, in which the time-keepers joined with the men. A regular relief watch was organized, the men taking turns, an hour at a time, in looking out for their superintendent. The effrontery with which some of the time-keepers testified to their own collusion with the men was no less than amusing; one of them acknowledging that as the work drew near an end they decided that they must nurse it, and at once fell to matching pennies, reading newspapers, and the like, while the men wandered off to play base ball, or to watch the steamers on the lake.

The Interoceanic Canal Congress just held at Paris bids fair at the time when we write to come to definite and profitable conclusions. According to the latest telegraphic reports the difficult comparisons between the merits and costs of the half a dozen different routes which have been advocated before it are nearly finished, and it is likely that before this paper is issued our readers will have heard that the Congress has reached its final decision and adjourned. The great question has been between the route recommended by Lieutenant Wyse of the French Navy, and favored by M. de Lesseps, which, as we have more than once mentioned, crosses the Isthmus of Darien at its narrowest point, from the Bay of San Miguel, by an enormous and costly tunnel seven miles through the mountains; and the longer routes, which avoid tunnelling by following water-courses and using locks, among which the favorites are the Atrato-Napipi route, south of the San Miguel line, surveyed by Commodore Selfridge, and the Northern Nicaragua route advocated by Admiral Ammen. This last is commonly spoken of as the "American route," — the San Miguel being called the "French route," — and is the longest of all; but makes most advantage of natural waters, and besides being apparently the least difficult to construct promises the best and surest supply of water for navigation. Another route, which has found favor and was pressed by Mr. Menocal, engineer in the U. S. Navy, is known as the Panama route, which, taking advantage of the Chagres River, follows nearly the route of the Panama Railroad.

M. de Lesseps gave strong support to the Darien scheme of Lieutenant Wyse, arguing that the essentials of a ship canal were that it should be a sea-level canal, without locks, and with good harbors at each mouth. These conditions the Darien scheme would satisfy; but the Committee on Technique, to whom the various projects were referred for estimates of cost, staggered the Congress by reporting that the lowest estimate for this route, under the most favorable circumstances, was one hundred and sixty millions of dollars, — a cost which would be indefinitely exceeded if water were met with in tunnelling, — while that of either of the rival routes would be about one hundred millions. The English member of the Congress, Sir John Hawkshaw, clinched this argument by declaring that a sea-level canal at this point would have to carry the water from the adjacent hills, and would be overflowed by it; that in time of freshets the whole section of the ship tunnel would be insufficient for the water that would pour into the canal, while the current would be enormously rapid. This speech carried special weight, because Sir John had spent three years on the isthmus in times past, and knew its topography. Together with the estimate of the Committee on Technique, it seems to have been enough to turn the Congress against the Darien scheme. It was thought that the French engineers, if they found this project rejected, would give their support to the Atrato route as that which was most nearly like their own, since, though much longer, it would also avoid lockage by tunnelling, of which in this route there are only three miles. It is in fact the old question, which comes up again and again in engineering schemes, between undertaking difficult and costly construction in the hope of satisfactory and easy working at the end on the one hand, and on the other a cheaper construction with greater cost and difficulty of operation. The daring spirit of the French engineers usually leads them to choose the first alternative, and the end is very apt to justify them. The English and American engineers, more afraid of first cost, and somewhat less influenced by pride in the perfection of their work, are much inclined to choose the second. Appearances seem to show that the easier constructions will carry the day in the Congress. This of course gives it only an advisory authority, but it is not likely that capitalists will be more venturesome than the Congress. Undoubtedly the canal will be built at some time, and, considering the timidity of capital, it will probably be built in the cheaper way. But lockage is a most vexatious and expensive impediment in the use of a ship canal; should a high-level canal be built and be found profitable for commerce, it would not be very surprising if in another generation it were discarded, and a second built at the level of the sea.

The Tenth Annual Report of the Massachusetts State Board of Health is before us. It contains two or three papers of more or less value to architects. Among them is an essay on asylums for the insane, prepared at the especial request of the Board by Dr. Clouston, the superintendent of the Royal Edinburgh Asylum for the Insane, in which he urges the most advanced views concerning the arrangement and construction of insane hospitals, arguing strongly for the subdivision of the patients and the disuse, as far as possible, of all appliances for confinement, or even of restraint, and supporting by his experience at Morningside his conclusion that a large proportion of the insane "can be managed and treated without any special contrivance of buildings, and that many of them can live in houses just like those inhabited by the general population." With this idea he argues for the utmost cheerfulness and freedom in the arrangement of buildings, taking in fact the Swiss hotels as a type to be imitated, and depending as little as possible on bolts and bars. Some of Dr. Clouston's ways of carrying out these principles would stagger the people who have been complaining bitterly of late against the costliness of certain of the American asylums; as for instance when he says that in the sick ward for paupers lately built he has used for the windows only plate glass in large panes. He gives a model plan for an asylum, which should hold two hundred patients, including the average proportion of different cases, — acutely excited, mildly insane, sick, convalescent, etc., — dividing them among different buildings more or less detached and sometimes widely separated. He dwells much upon the importance of association, even preferring common dormitories to separate bed-rooms, and recommending a common dining room with a *table d'hôte.* He would supply drawing-rooms, conservatories, billiard-rooms, and a gymnasium, and lays stress on the wholesome influence of plate-glass, inlaid-floors and tiling, and decorated walls. The plans are accompanied by a description which suggests many important details of planning and fitting. There is also a paper on Common Defects in House Drains, by Mr. Eliot C. Clarke, which tells a good deal that experts will recognize as true; a Contribution to the Study of Ventilation, by Dr. Edward Cowles, giving the results of some experiments and examinations made at the Boston City Hospital under his charge; a paper by Dr. Frederick Winsor on coal gas from heating apparatus; as well as essays of less technical interest to architects, on the growth of children, and on Physical Education and Hygiene in Amherst College, etc.

ON THE RELATION OF ARCHITECTURE TO UNDERWRITING.[1] I.

Mr. President and Gentlemen:

I have been requested to address you on "The Relation of Architecture to Underwriting," a theme which seems very pertinent to the present occasion. It is one which may be presented with equal interest by an architect or an underwriter. In the present instance,

[1] A paper read before the New York State Association of Supervising and Adjusting Insurance Agents, at Syracuse, May 20, 1879, by Mr. P. B. Wight, architect.

perhaps more by accident than otherwise, it is presented by an architect. It is unavoidable, therefore, that it will have to be considered from the architect's point of view. We will know more about it when we hear from the other side, — the profession of underwriting, to which most of my audience belong. But I trust you will not infer that this is a subject for discussion or controversy. I allude rather to the fact that in considering it we may come to a better understanding of what it is, from the opinions of the two professions concerned, than one.

These professions have been brought into more or less intimacy, — much less than would be good for the interests of both. Therefore, standing as it were alone before you, I can but offer a few suggestions with the hope that they may lead to a more serious consideration hereafter of the many problems connected with the art of building in which the interests of underwriters are deeply concerned.

Though you rate a building according to its supposed risk in case of fire, I will take it for granted that on general and broad principles you desire that risk to be as low as possible. Any other consideration of the subject would be based upon the supposition that insurance was a species of gambling, rather than a science based upon general averages. If there are any who hold such views, as I have often been informed, it can only be regarded as a misfortune to your profession.

It is of the greatest importance that you fully understand the nature and construction of buildings with reference to the dangers to be apprehended from both the inception and spreading of fires. It is of equal importance that the architect should inform himself, from your experience in collating statistics, as to what systems of building are least dangerous in regard to both contingencies. Architects have been soundly berated for their neglect to provide against these dangers, in numberless instances, while it is also true that in those very cases the insurers have been equally negligent in discovering the sources of danger, which should have been detected by an efficient system of surveying before the risks were taken. No amount of neglect on the part of one should escape the eye of the other. We are all seeking light and we have much to learn.

On an occasion like this I can do little more than point out what are the chief points of danger from fire in buildings as usually constructed, and suggest some remedies. By this means I may enable you to see more clearly what you have to contend with, and what, if you desire to diminish the fire risks, you may reasonably demand.

It is certainly to your interest that there be no large fires. If there were none at all your occupation and usefulness would cease altogether; but that is a contingency not to be apprehended. There are very few articles among the *contents* of buildings which are not combustible and liable to take fire, even if the buildings are not, and no fire can take place among them which will not cause *some* damage to the building which contains them. Fires very seldom commence with any part of a building, but almost always with their contents. Conflagrations in buildings once commenced are extended from two causes: one is the rapid consumption of the materials of the building, the other is the rapid spread of fire through a building, partly caused by the combustion of its contents. The one is prevented by the use of incombustible materials, the other by the separation of the several parts by natural barriers. The former is generally known as fire-proof building; the latter is known as the compartment system. Another element enters into the progress of all fires, and that is the danger of a fire in the contents destroying by its intensity the structural parts of the building, and extending from one part to another, as if a train were laid for it. The compartment system is essential for the prevention of such a contingency.

FIRE-PROOF BUILDING, SO-CALLED.

We have heard and seen much of the so-called fire-proof buildings and often to our great sorrow. Many have proved to have had in them elements of danger greater than they were supposed to obviate. But it is not my purpose on the present occasion to describe that class of so-called fire proof buildings which have proved to be only frauds and delusions when put to the test. There are plenty in existence now. You will readily know which they are when the definition of a proper standard of fire-proofing is fully understood.

Fire-proof buildings should be properly classed under two heads. The first class should be known as buildings constructed of incombustible materials, thoroughly protected from the action of fire. The second comprises buildings constructed partially of combustible materials, also thoroughly protected from the action of fire. The difference between them is two-fold.

First: The former class involves more expensive processes than the latter. Second: it is more durable as against decay and deterioration. With regard to fire-resisting qualities they may both be equally good.

It is one of the latest developments of the art of building that fireproofing depends more upon the *protection* of the materials of construction than upon the materials themselves.

It was once supposed — and some architects still hold to the opinion — that incombustible materials were necessarily fire-proof. There are those who still contend that if all combustible materials are avoided in the construction and finish of buildings, they are practically fireproof. This can only be the case if all the materials are brick and all the contents are incombustible. With the exception of brick there is no material which enters into the construction of modern buildings that can be considered fire-proof. But it is hardly within the range of possibility that the contents of any building shall be wholly incombustible, and it is on account of the combustible nature of the *contents* of a building that all the materials of construction other than bricks become endangered. As an illustration: the late Mr. Hatfield, at a convention of the American Institute of Architects held in Boston in 1871, mentioned that a mill at Oldham, in England, which was constructed with floors entirely of brick arches, and without beams, having iron columns for support, was destroyed in this manner: A small fire occurred on the lower floor where some lumber had been piled around one column; the column bent and broke; the additional weight thus imposed upon the adjacent columns caused them also to give way, and one after the other all the columns broke and the mill became a total wreck.

With this premise let us now proceed to consider what constitutes a fire-proof building of the first class.

FIRST-CLASS FIRE-PROOF BUILDINGS.

The material which enters most largely into the construction of buildings is brick, consequently in the principal item of materials required, nothing further is to be gained. Even bricks are not indestructible by fire, as they vitrify at various temperatures, according to the nature of the clays of which they are composed; vitrifying more readily as they contain oxides of iron. But it is necessary to take some material as a standard for the fire-resisting qualities necessary to a fire-proof building, and for all practical purposes I assume that brick possesses those qualities. All materials known as terra-cotta are essentially brick and are intended to be so considered when the word is used. The walls of buildings are in nearly all cases constructed of brick. Stone buildings are exceptional in this country. A few churches and mills are constructed entirely of stone, but only buildings, the main parts and especially the interior of the walls of which are constructed of brick, can be considered as fireproof. Walls constructed entirely of concrete, however, are nearly equal to bricks for fire-resisting qualities, but concrete buildings are exceptional, and, being more expensive than those of brick, are not likely to be built in great numbers. Exterior stone facing on brick walls does not materially affect their fire-proof qualities. There are but few natural stones that have any fire-resisting qualities. The damage to the exterior stone-work of a wall is as likely to be caused by fire in an adjacent building as in the building itself. In the latter case the damage is generally caused by fire issuing from windows. This constitutes one of the insurable elements of a first-class fireproof building. No wall built entirely of stone can be considered to be fire-proof.

Before proceeding further it may be well to explain that the expression "materials of construction" herein used is intended to apply to those materials which sustain weights and are subjected to strains, whether compressive, transverse, or torsional, and does not apply to finishing materials, such as doors, door-trimmings, windows, floors, and other parts which are introduced after a building is constructed. It applies to the structural frame-work, the destruction of any part of which is likely to result in damage to the whole structure. In a first-class fire-proof building the amount of insurable property depends upon the amount of combustible and destructible materials used in the finishing. In such a building, constructed to resist the action of fire in the finishing materials and contents, there should be no occasion for a loss in the structural portions, but only a possible damage to the finishing portions on account of their exposure to the burning of its contents.

Now, such a building, to be theoretically fire-proof according to the standard I have assumed, should be constructed entirely of brick, — walls, floors, partitions, and roofs. But the purposes for which modern buildings are required are such that the universal employment of brick is impracticable, and other materials capable to sustain compressive, torsional, and transverse strains must be employed. In a first-class fire-proof building in which the structural materials must be not only incombustible but indestructible by time, no material is more practicable or economical for these purposes than iron. Iron is therefore used in its two conditions, wrought and cast. The former has all the qualities requisite in a building material, the latter is only valuable as a material to resist compression, — though for short lintels subjected to transverse strains, it is valuable to a limited extent. Wrought-iron only can be used to advantage for long lintels, girders, and beams. Both kinds may be used for columns or piers.

But, notwithstanding the valuable qualities of iron as a fire-proof building material, as just stated, it is not a fire-resisting material, and fire acts upon it in a different manner than upon any other material of construction. It is not reduced in quantity, but diminished in strength by the action of heat. Mr. F. Schumann, the mechanical expert of the office of the Supervising Architect of the Treasury Department, says that iron used with a co-efficient of safety of three, at the normal temperature, loses all practicable strength at 977° F. Beams and girders will sag, especially if the lower parts of them are exposed, as is most likely to be the case. Their expansion at these temperatures will force walls apart and destroy the integrity of brickwork. In the Chicago fire of 1871, the walls of the *Tribune* building were more damaged than the iron floors. They were so much cracked by the expansion of iron beams that it was necessary to take them down. At this temperature columns expand sufficiently to force the floors above their proper level. The more they expand the greater

becomes the strain on them, for they are endeavoring to *lift* the loaded floors which are held down by the walls. In this condition a stream of water thrown on them will cause the side upon which the water strikes to contract, and the column thus overloaded and bowed out of a straight line breaks. This accounts for the many broken and slightly bent iron columns often found in the ruins of buildings in which the heat had not been sufficient to melt them.

Consequently it is essential that all constructive iron-work should be protected by an incombustible and non-conducting material. Whatever is used for protecting purposes should be so effectively secured to the iron work that it is not likely to be removed by any contingency which may arise during the progress of a fire.

The principal use of iron in fire-proof buildings is for the construction of floors. The simplest form of floor construction is where the beams rest on walls at both ends. All iron floor-beams now used are of the same section, differing only in size and weight, and are known as I beams. The problem of fire-proofing floors consists in the method employed to bridge the spaces between the beams, which are seldom less than three feet or more than six. The simplest, strongest, and cheapest is the brick arch. It has been used in fully one half of the buildings with iron beams that have thus far been constructed. But it gives neither a flat ceiling nor a level floor. If the ceiling is required to be flat it must be suspended beneath the beams. In a large majority of iron-beam and brick-arch buildings these suspended ceilings consist of wooden strips and laths plastered, leaving spaces under the arches from wall to wall. There are several methods in use, however, by which these ceilings may be made entirely of incombustible materials, so that they will form a protection to the beams and arches. The floors are made level when brick arches are used by filling in the spandrils with concrete. The objection to brick arches as usually employed is that they leave the lower flanges of the beams exposed; and these are the parts which it is most important to protect from fire.

The principal method heretofore used in protecting the lower flanges, when brick arches are used, has been to suspend wires or wire-netting or small bars of iron under the beams, and to cover the same with plaster. The most effective method is to employ large skew-backs of brick or concrete, made so that those on opposite sides meeting at the bottom will form a complete inclosure of the lower half of the beam. The best material for the skew-backs, as well as for the bricks forming the arches, is a body of clay and saw dust, burned like ordinary bricks, called porous terra-cotta. This material possesses all the strength required for bricks in such places. Thus far skew-backs, such as I have described, have been used in only one structure that I know of, the Mitchell Building at Milwaukee. Ceilings of rooms thus constructed when plastered on the bricks look as if supported by very large beams, and it is better in all cases where such a thoroughly fire-proof system is employed not to introduce a suspended ceiling.

A method of bridging the spaces which has been largely used consists of arches of plain or corrugated sheet-iron resting on the lower flanges of the beams and filled above with concrete, which is levelled up to the tops of the beams. These are substitutes for brick arches and have the same defect of leaving the lower flanges of the beams exposed. The concrete arches thus formed over the sheet-iron will, if composed properly, form a sufficient support for the floors, independent of the iron arches. These combination arches will resist heat quite as well as brick ones, and if they were combined with protecting skew-backs would make good floors. To avoid the necessity of suspending ceilings where they are desired to be flat, what are termed flat-arches are employed. These have the great advantage of lightness of construction. They may occupy the full depth of the beams and leave the floors and ceilings flat. They are made of hollow blocks, which are so put together that they have the construction, if not the form, of an arch. The joints radiate from a common centre, and one internal rib takes the form of an arch. They are made of three materials: 1st. Hard pottery or tile. 2d. Porous concrete. 3d. Porous terra-cotta. The first is the least fire-resisting, the last the most so. The undersides of these flat-arches are slightly lower than the beams, and the protection afforded to the beams consists of a body of cement, or plaster, which is held by the edges of opposite blocks. To this protection is added the plastering, which covers the whole ceiling uniformly, and, by being incorporated with the whole mass of beams and arches, forms part of the fire protection. Hard tiles are brittle, and, if heated on one side more than on the other, will crack. Porous concrete is made light by being diluted with furnace slag, or ground coke. The best made is composed of lime of Teil and plaster of Paris. The plaster is used to facilitate the manufacture in the quick setting of the material. This material will not crack under heat, as it is very elastic, but on account of the presence of plaster, which has an affinity for water, when it is heated, may soften by the absorption of too much water. If covered by a coat of cement or mortar, however, it is not open to this objection. Porous terra-cotta will neither crack under heat nor deteriorate by the absorption of water when heated. It is tough and elastic, and for all purposes of fire-proofing is the best material yet known. The last described material and construction is the best to employ where flat ceilings are desired.

The above methods of fire-proof floor construction do not comprise all that have been used or invented, but are such as may be considered practicable in all cases. The solid concrete floor has been little used, and has much to commend it. The present occasion will not permit of a description of its construction in detail, as several methods have been used which employ more or less iron. Suffice it to say, however, that as long as the beams are completely encased, such floors may be considered to be thoroughly fire-proof.

A roof, where supported on brick walls, may be considered and treated the same as a floor, only of lighter construction. There is no reason why it should be protected on either the upper or lower side less than a floor.

When the floor spaces of a building are large, a more complicated system of construction is necessary. This usually consists of columns and girders. Piers and arches may be used for the same purpose, but whatever form these supports take they are substitutes for walls, and have the same work to do, hence they should be fully as fire-proof as walls. The natural progression from walls to this form of construction is as follows: The first step is a wall with arched openings. If the openings are so large as to reduce the spaces between them to the point of weakness, these spaces are thickened and become piers. The column is a substitute for a pier, and the girder or lintel for an arch. Iron is the material in which these can occupy the smallest space, hence iron is a necessity for such purposes. In most buildings as heretofore constructed, these parts have been the most vulnerable to fire, and there are numerous instances of the destruction of buildings supposed to be fire-proof from this cause alone. The most notable was the Custom-House and Post-Office in Chicago, the entire interior of which was destroyed by fire on October 9, 1871. A new building to replace it, and costing $3,000,000, is now nearing completion, and, except in the fact that it has incombustible plastered ceilings suspended beneath the beams, is in no respect superior in fire-resisting qualities to the former structure. The danger is increased when, as often occurs, the lines of columns and girders carry brick walls, — in stories above the first or second. It is in view of this danger that the building law of the city of New York requires that iron columns having to support interior brick walls shall be covered by some kind of fire-protecting material.

Iron columns can be made entirely secure from the effects of fire by a covering of fire-resisting material of not less than two inches, provided it is properly secured to the iron-work. The best method of securing a fire-proof material is by screws put directly into the iron. The material may be porous terra-cotta, or porous concrete, cast in blocks. These materials possess within themselves the most important of non-conducting materials, — air; hence no special air spaces are necessary, — and they can be solidly cemented against the iron. The best form of column for fire-proofing is a small round column with four projecting flanges from bottom to top. Blocks three inches thick may be set within the flanges, projecting one inch outside of them, and held in place by small plates, screwed down to the flanges. Round columns in existing buildings can be covered with sectional pieces, one and a half inches thick, set in courses and secured at the horizontal joints by iron hoops inserted between the pieces. The Phœnix wrought-iron columns, being flanged by their construction, may be easily fire-proofed by setting gores of fire-proof material between the flanges and securing them with buttons hooked over the rivet heads.

Girders are generally made by placing two I-beams together. They can be covered with fire-proof blocks two inches in thickness. One piece should be placed on each side and one under the bottom. The bottom, being dovetailed, can be held by the side blocks, which are so formed as to admit the dovetailed block. The side pieces will rest on the flanges of the girders and may be secured to the iron with countersunk screws. Sometimes girders are covered with iron laths, or woven wire. But this has generally been done to provide for plastering and not with a view to making the girders fire-proof.

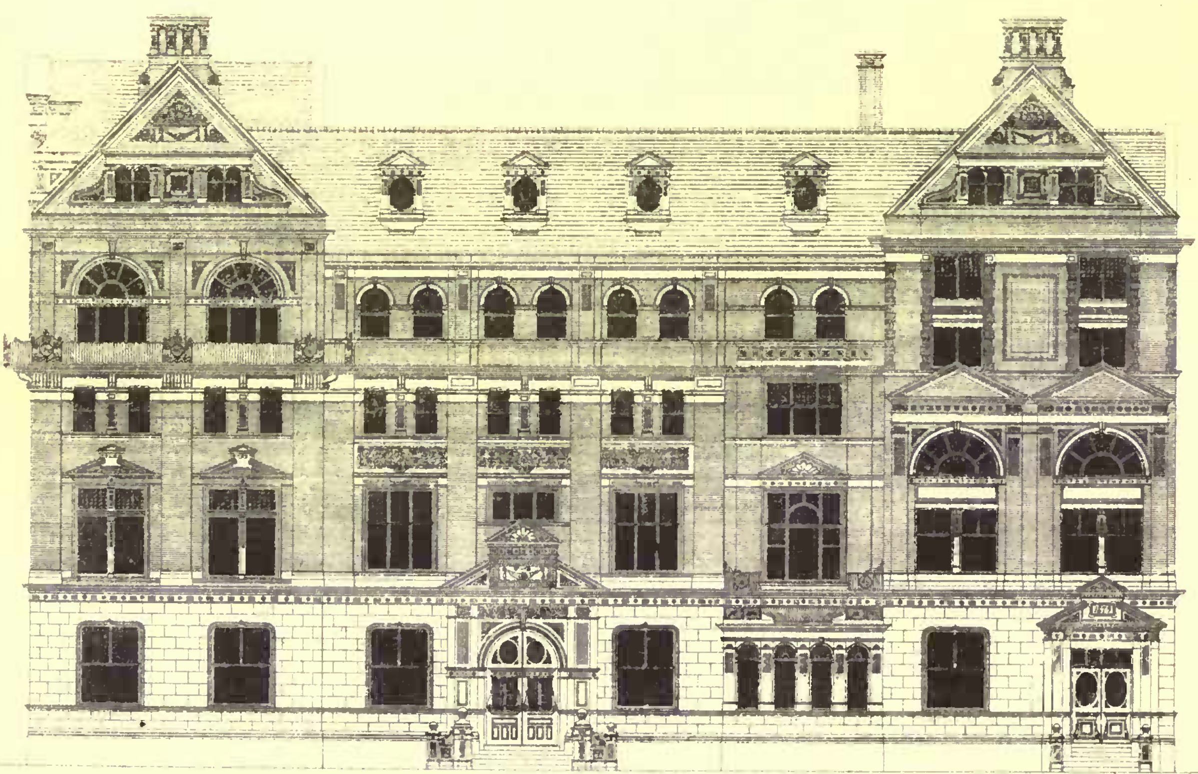
A still more complicated form of construction is required when large spaces of floor have to be supported without columns. In doing this, the architect must resort to truss work. The trusses are sometimes inclosed in partitions according to the plan of building. In that case, if the partitions are made entirely of fire-proof material, so as to cover every part of the truss, the construction will be safe. In case the truss is exposed every part of it should be covered in detail, following the methods used on columns or girders, according as they may be most easily employed.

In the case of a roof covering an extended space, and requiring supporting trusses, all the parts of the trusses should be covered individually as last described. Where trusses are employed, a light covering for the roof is essential to relieve the trusses of too great a weight. Among numerous methods in use the best is the following: Light T-iron purlins are placed sixteen inches from centres. Blocks of porous terra-cotta or concrete, two inches thick, are set in mortar on the flanges of the T-iron. As this leaves part of the T-iron exposed below the blocks, the purlins are covered by placing tiles six inches square and one inch thick on the underside of the blocks, and covering the irons. They may be held with nails and then plastered over. The bottom surface thus becomes a continuous surface of fire-proof material. When this has a coat of mortar and cement it will protect the roof effectively from any fire that may occur under it. The upper surface of the fire-proof blocks may then be covered with metal or slates nailed into them, or a cement or composition roof may be placed directly upon the blocks.

Partitions, as distinguished from partition walls, are such as may be carried on floors for subdivision into rooms. Various methods for



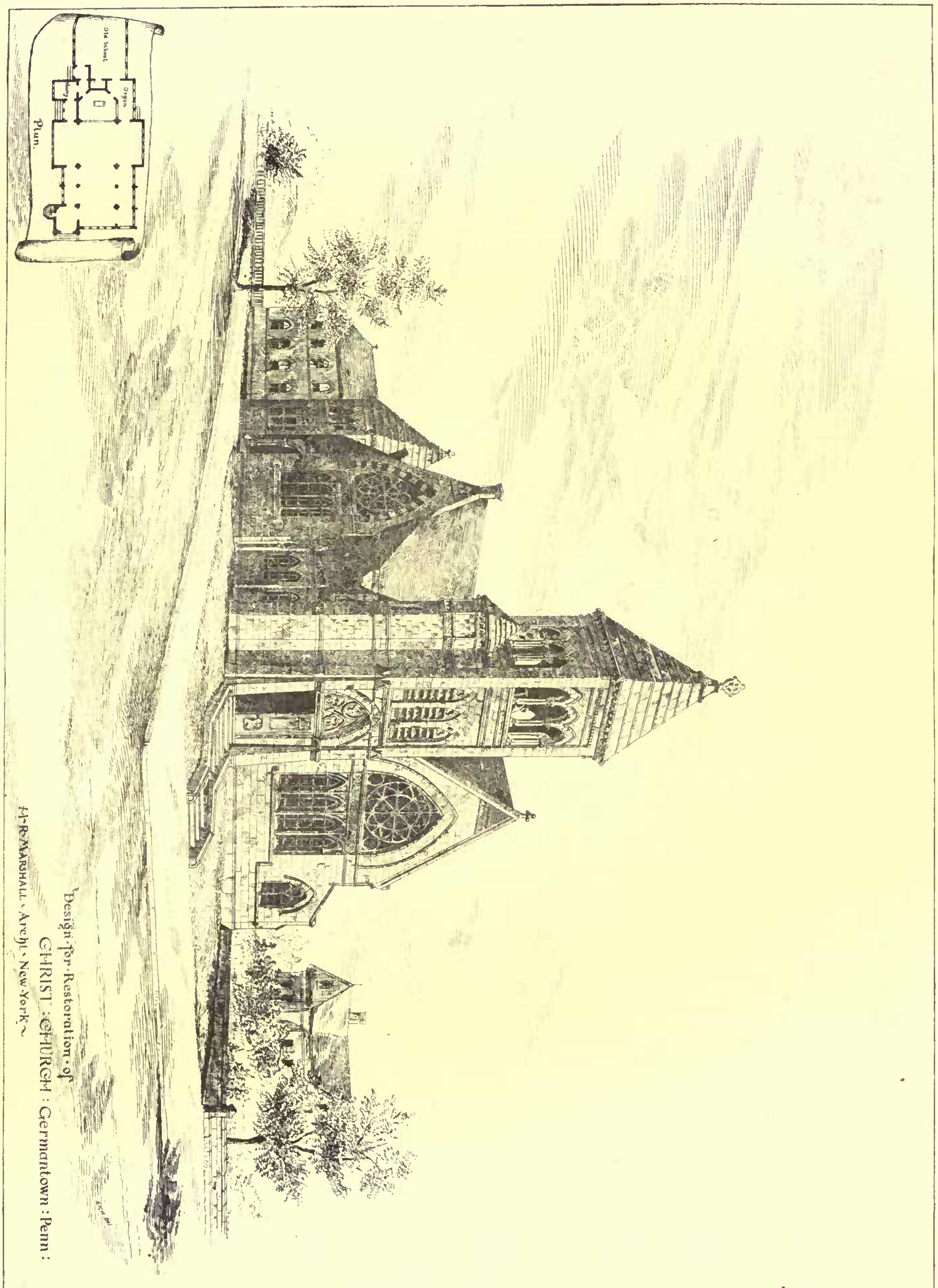
LONGITUDINAL SECTION.



Elevation on 39th Street

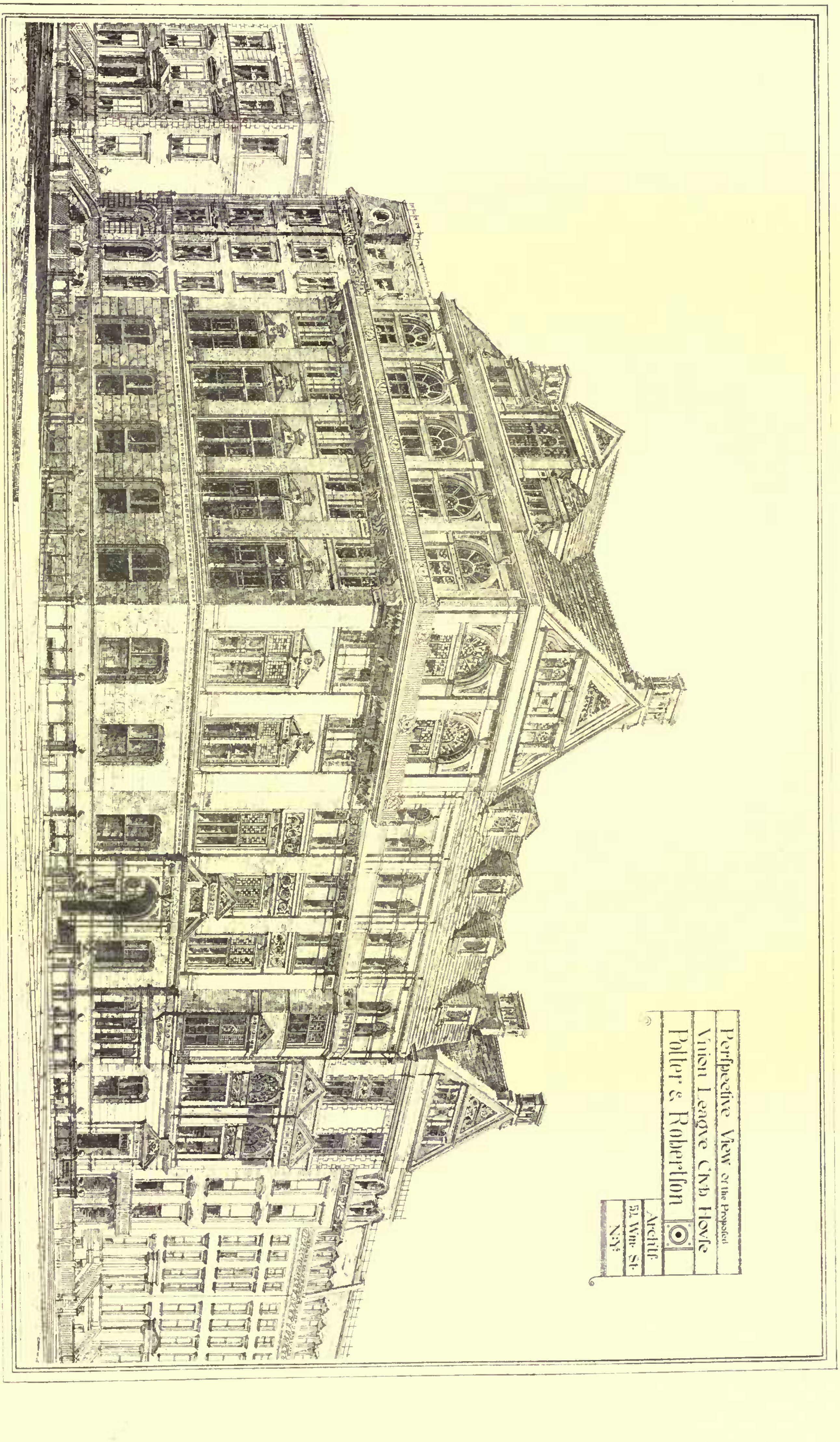
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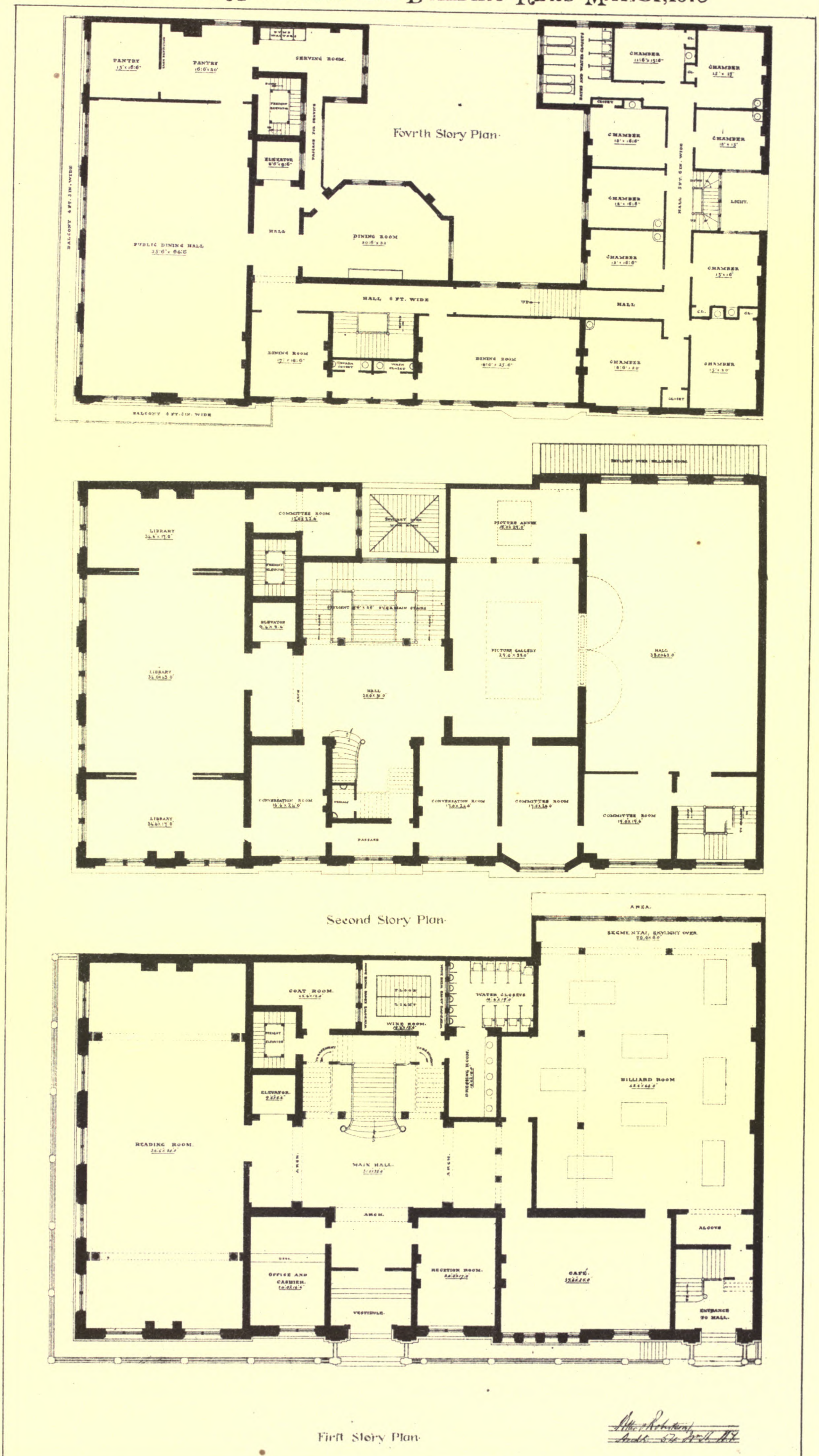


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Union League Club House

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constructing these with incombustible materials have been employed. They have been made of brick, eight inches thick, or four inches thick strengthened with iron studs, or of studs covered with iron lath or woven wire, and plastered. But the kind of partition now generally used, and valuable for lightness and economy of construction, is one built of hollow blocks of light porous concrete, or porous bricks. Such partitions may be from four to six inches in thickness, according to length and height. Plastering is applied to them directly. They are especially convenient on account of the ease with which they may be moved or altered.

THE ILLUSTRATIONS.

COMPETITIVE DESIGN FOR THE UNION LEAGUE CLUB-HOUSE, NEW YORK, N. Y. MESSRS. POTTER & ROBERTSON, ARCHITECTS, NEW YORK.

DESIGN FOR THE RESTORATION OF CHRIST CHURCH, GERMANTOWN, PA. MR. H. P. MARSHALL, ARCHITECT, NEW YORK.

THIS design was prepared in consequence of the destruction of the old church by the gale of October last.

NEW YORK YARDS. II.

THE owner of a piece of land held only for light-and-air space, perhaps undervaluing the light and air secured by it to himself or others living on his property, and not feeling concerned in the light and air secured by it to other people and their families or tenants, is tempted to try to make a further use of it. And as, in a city, the only ready use which he can make of such a piece of land seems to be to build on it, he is tempted to build on it, either for his own use and pleasure, or to make it more profitable property. If such land forms the rear part of the lot on which his own dwelling stands, he is perhaps daily reminded that he has no use for so much land merely as a yard to dry clothes in, while he must pay a considerable sum yearly for it in interest on its cost and in taxes.

The system of "back buildings" prevalent in Philadelphia and Baltimore, in many respects excellent, by which the full width of the lot is not covered while good ventilation is secured, is unknown to him; so he diminishes the light-and-air space in the rear of his house, not by the least harmful, but by the most harmful, method. He makes an addition to the depth of his house, and of the full width of his lot. Thus, in the upper part of New York, where the most costly houses stand, the yards are gradually being filled up. People deprive themselves and their neighbors of light and air with every feeling of self-approval. What people do towards diminishing the air-spaces of the city, in ways bad enough behind their own houses, they do in worse ways behind houses intended for tenants, whether hotels, the larger boarding-houses, apartment-houses, or tenement-houses. It is only in the case of the latter that we are brought face to face with some of the worst results of this growing state of things, the evils of which few are willing to recognize because they see no remedy for them. Whatever evils and discomforts result from over-building are brought about, in New York, by a system actually intended to prevent over-building, and to secure to all the dwellings of all the inhabitants of the city abundance of light and air. New York was laid out on the theory that every householder would need a large yard at the back of his house, and on the further theory that every head of a family would be a householder. And so sure of their theories were those who laid out the New York deep-lot system, that they ingeniously and with the highest purposes made the system such as would force upon every purchaser of real estate land enough for a large yard in addition to the land used for houses and other buildings; for they had a further theory that houses would be rarely built more than fifty feet deep, at the outside. Basing their system on assumptions, which the results have proved to be wholly erroneous, they proceeded to secure wide and abundant air-spaces by practically forbidding purchasers to buy land in pieces of less than one hundred feet in depth, by simply making the purchase of pieces of land of less depth impossible. They secured the holding of the land continuously in such deep parcels, by making it practically impossible to sell off any portion of it, except by dividing it longitudinally, and by making it impossible to get at the back of a lot except through its front portion. All their methods were ingenious and have been generally successful, — too successful. While all their purposes were good, the general result has been disastrous. We see here, as in almost every known case of an attempt to bridle the future, and to interfere with natural laws of demand and supply, a failure to secure the good result intended, and the development of unforeseen evils which would not have arisen but for that attempt.

The genius of good intentions seems to us at this moment thus to address the rich New York real estate owner : "I wanted you to have the back of your house well lighted and ventilated. With this view I have been in the habit of forcing you to buy a piece of land in the rear of your house for a light-and-air space, and for which you could have little other use. And in order that it may be kept consecrated to that use, and to make certain that you may not part with it, I have prevented all access to it except through the front of your lot, and thus made it practically impossible to sell one part of your property without selling the other part of it." Of all this the motive is good, the method is ingenious, — but the result is disastrous.

"Saddled with a piece of land which has cost a large price but which you cannot sell off, you endeavor to get more out of it than merely light and air. You conclude that it gives you more light and air than you want. At any rate you can do with less ; and you proceed to show with how little you can do. It seems that the richer you are the less light and air you care for, and the bigger you build your house, by encroaching on the open space for light and air in the rear of it. Thus the very measure, which I have with so much forethought and care taken to secure to you plenty of light and air, has led to the precisely opposite result.

"Wishing to secure the same benefit to your neighbors that I had intended to secure to you, I had taken care to extend to them the same rule which I had made for you. In order that all houses might have plenty of light and air in the rear, no property owner was allowed to buy, in most parts of the city, less than a hundred feet deep of land. In this way I hoped to secure to every individual in the community the same advantages that I had intended to secure to you. Judge, then, of my affliction when I see you not only shutting out light and air from half the rooms in your own house but also cutting them off from your neighbors by the bigness of your main or rear buildings. And judge of my further affliction when I find that in so doing you have set your neighbors a bad example, which they are all hastening to follow. Scarcely is your fine dining-hall, library, and picture-gallery completed, when I see many of your neighbors adding to the depth of their houses : some with one room, some with more, according to their ability. For a moment I had hoped that the bad example which your wealth enabled you to set, the lack of means on the part of most of your neighbors would hinder them generally from following. But I soon see that I have again miscalculated, and observe also that the deepest of all the additions is that put on an adjoining house so as to convert it into a boarding-house, where the number of rooms to let, rather than light or ventilation, is naturally the main consideration. But the boarding-house does not long remain the deepest house in the neighborhood, for the house adjoining it is now being converted, by a few alterations and by a still more extensive adding-to in the rear, into 'French flats,' that is, into such tenements as are called by that name. This last building covers more ground and shuts out more light and air, from both its occupants and its neighbors, than even the 'improved' tenement-house farther down the street, where the depth of the lot which I had forced upon the owner, and the ordinance forbidding 'rear buildings,' if *separated by a space for light and air*, from the main building, had resulted in the building of a house some eighty feet deep, though but twenty-five feet wide, and with nominally four families on a floor (though really often twice that number, or more), each of which lives in a dark, unventilated cave, about forty feet deep and but twelve feet wide, very conveniently divided into a suite of rooms, only one of which has windows, light, or air.

"When I see what a bad return has been made me as a result of my efforts to secure plenty of light and air in your house and your neighbor's, I am tempted to let you alone in future, more particularly as I observe that in a neighboring city where people have been let severely alone, to cut up blocks with intersecting streets and lanes to any extent, no bad results of any kind have arrived. That which I had attempted to secure by legislation has been secured when people have been left to take care of themselves."

How can one look out of a back window of the ordinary two-room-deep house, of the days when the deep-lot system of the upper part of New York was adopted (if any such house be now to be found), and contemplate all the yard space which a continuation of such houses all around the block would leave in the centre of the block, and not be struck with the ample provision of light-and-air space which would be so provided? And then how can one look at the number of dining-room extensions of the houses all about him, behind each one of which is a drawing-room lighted only by a borrowed light, and getting air only through an adjoining room, and not be struck with the contrast between what was intended and what is? Or where a whole house is three rooms deep, how can one sleep in the middle room without compunction if shut off from the rooms on each side of it? Or, if for the sake of air and ventilation he is obliged to use two rooms where one would serve, not feel a sense of regret when thinking of the great majority who cannot afford such a luxury? The making a luxury of fresh air, so that only the rich can indulge in plenty of it, is a most regrettable result of the well-meant New York deep-lot system. And who will not smile at the simplicity of the ideas of those who laid out New York with a lot of ground so large as 25 by 100 feet for every householder, and expected him to be rich enough also to let half of it go unbuilt on and lying idle? Or at the inconsistency of such ideas with the now prevalent notion that overcrowding in New York results from the small size of the island on which it is built? And every one, if he chooses, can assure himself that, whether or not the size of the island has anything to do with New York overcrowding, still the curious fact remains that instances of just as bad overcrowding and just as unventilated tenements are to be found in Jersey City, Brooklyn, Newark, Chicago, or whatever place is nearest him, where the same system as that of New York prevails, of deep lots with narrow frontage and no access in the rear. And this although that system aimed at, and was invented to secure, to every family, a large yard; and with it plenty of light-and-air-spaces. But now that large yards are no longer needed, and are fast disappearing, the deep-lot system has proved

itself no longer fitted, whatever it may have been once, to secure the end intended. It is time it should be superseded by something better adapted to the present wants of the city. The whole subject of the distribution of space in cities should be more thoroughly studied than it yet has been. Laying aside prejudices we should be willing to examine and recognize systems which have led to better results elsewhere. Especially we should make sure whether or not as little interference as possible with the natural laws of trade in real estate does not lead to securing the best interests of the community by securing the best interests of the individuals that compose it.

CORRESPONDENCE.

ARCHITECTURE AT THE ROYAL ACADEMY.

London, May 1, 1879.

The display of architectural drawings is decidedly less in quantity if not in quality this year, than it has been for several years past. Perhaps this is accounted for by the rumor of a more than ordinary number of rejections; certain it is that several very well known drawings, which were expected to form part of the year's show, are not on the walls, and in looking round the collection it is equally certain their places are filled by works very far below them in merit, either as designs or as drawings. Why this is so is just one of those things no fellow can understand, — not even the R. A.'s themselves, we presume, — but this being the case, we must take what the council have been pleased to select from the number submitted for their inspection, as representing the architecture of the year, and look at it accordingly. A general glance will show that it is a very mixed lot, while few of the designs rise high above the average of merit. Mr. Barry among the Academicians, and Mr. Pearson among the Associates, are conspicuous by their absence, while a second R. A., Mr. Norman Shaw, sends only *one* of his beautiful drawings. Among outsiders absent, the most notable, perhaps, are Mr. Bodley, Mr. Seddon, Mr. Bentley, and, as formerly, Mr. Nesfield. In any display of English architecture these names can ill be spared, and so it is somewhat disappointing to find none of their works at Burlington House. Of the drawings that are there, about a third are those of ecclesiastic, and the remainder of secular work, of various kinds from gate lodges to town halls.

Taking the designs seriatim, we first notice No. 1069, Kew Hall, Norfolk, by Mr. J. J. Stevenson, — a rather lumpy design, in what the author would call "free classic," not very inviting as an English country residence. It is in red brick with stone finish, but the detail seems heavy and coarse, — perhaps that is the fault of the drawing, which is not a very good one, and is badly colored. The entrance door, with stair thereto, and the window above it are the best features, the bay-window in the gable to the right being clumsily managed.

No. 1070. A powerfully colored drawing by Mr. F. W. Suggate, of the interior of the grand old chapel of Henry VII. at Westminster. No. 1071. Denton-Hall, Grantham, by Mr. Arthur Blomfield; a large house in late Gothic, very good in style, but rather too much cut up, the whole pile looking more like some institution than a private residence; but the entrance, gable, and tower are striking and well designed. The drawing is in pen-and-ink, and the building is evidently in stone.

No. 1074. Harestone, Surrey, by Mr. Jno. Sulman, a poorly designed country house in the non-fashionable vernacular, not nearly so good architecture as the same author's church work.

No. 1080. School Board Offices, Leeds, and No. 1114, Municipal Buildings and Free Library, Leeds, by Mr. Geo. Corson. A large public building shown in the two views, in freely-treated classic, so much so that the School Board side looks very like a Gothic design in a classic dress, which, however, is not helped by the drawings, which are very liney, lacking in effect of light and shade. It is not nearly so good classic as the Town Hall on the opposite side of the street, a well-known building erected about twenty years ago, which does not say much for the progress of art in Leeds.

No. 1082. Church of St. Mary, Woolwich, by E. F. C. Clarke. A reconstruction (with additions) of an old nondescript church, said additions being in an equally nondescript sort of semi-classic, semi-Romanesque architecture, the reason for the adoption of which is not by any means obvious. This church seems to be rather unfortunate in its renovations. Some time since a design for it by another architect was published in one of the professional journals. It seems on that occasion to have escaped the Scylla of bad Gothic, only to land now on the Charybdis of unsatisfactory classic. It seems to us it would be much better to leave the poor building alone than torture it about in this way. After the above mediocre productions it is a pleasure to turn to No. 1083, Skipness, Argyleshire; a country house in the old Scotch baronial style. All one can say is that if this is a new house, it's remarkably like an old one, so well has its author, Mr. John Honeyman, of Glasgow, caught the spirit and expression of the old work. It is a most careful and artistic study of a style full of strong but picturesque features. The fenestration of the square keep-like central mass, with its quaint corbelled angle turrets, forms an admirable contrast to the tracery-beaded windows of the hall — just one of those happy effects one constantly finds in thoroughly good work, whether new or old. The subject is also well drawn and colored, so that it does not suffer, as some designs in the gallery do, from inferior representation.

No. 1089, Exterior, and No. 1097, Interior Views of competitive design for the Oratory at Brompton, by Mr. Geo. Wattress. Very well drawn and colored representations of a somewhat fussy, mixed-up kind of classic, reminding one more of some Spanish cathedral than an English church. In connection with these drawings it is interesting to notice the other designs that are here from the same competition. In No. 1099, we have an Interior of the selected design by Mr. Gribble. (We hear the Exterior was among the rejected. Why?) In No. 1100, an Interior; and in No. 1122, a Longitudinal Section of Mr. Geo. Gilbert Scott's design. In No. 1110, an Interior of Messrs. Goldie & Child's design, and in No. 1157, Mr. A. J. Adams's design. The church is of the dimensions of a small cathedral, and was required to be in the Renaissance style. Some thirty designs were sent in, and Mr. Waterhouse made a report thereon to the Fathers, who ultimately awarded the first prize to Mr. Herbert Gribble, and the second to Mr. Clutton. More than ordinary dissatisfaction was expressed at the result, for many reasons, and Mr. Clutton absolutely declined to receive the second prize which had been awarded to him. This was rather a strong proceeding, but not stronger than the occasion warranted, if the artistic merits of the designs are considered. At all events, here we have five of the designs at Burlington House, and of none of them can it be said, "It is a noble example of the style." Whether it is that our architects have not been trained in the ways of the Renaissance or what not, it is manifest from the examples shown here its true spirit is wanting, and the letter of it is but imperfectly understood. The details and many of the features of these interiors are coarse and ill proportioned, and it may safely be said that what is good of them is n't new, and what is new is not true. It would take up too much space to point out examples of this, though they are many, and they one and all fail to impress us with the fact that they are English churches in the sense that St. Paul's does, as apart from French or Italian versions of the same style. Probably of all the designs Mr. Clutton's, in eighteenth century classic, came nearest to doing this, but those in the Academy may be anything or anywhere. It seems to have been forgotten that we have an Anglo-classic style, as distinct from French or Italian, as our Gothic is from the continental work of the same period; and if this competition is to be taken as any criterion, we have few Renaissance architects amongst us who are capable of designing a great church which would take high rank as a noble work of art among the structures of the world.

We come now to a remarkable series of designs by Messrs. George & Peto, illustrated by most careful and effective drawings. No. 1086, Barrow Point, a house at Pinner; 1087, a coffee-house at Streatham Common; 1140, cottages at Pinner, and 1149, Hillier's Almshouses at Guildford: some of the most charmingly artistic work in the whole collection; quaint without affectation, picturesque without an effort; quiet, peaceful, and thoroughly English in feeling and sentiment. It gives one unmingled pleasure, after the restless productions one sees so much of nowadays, to come across such work as this. The laborers in the cottages, and the old people in the almshouses, must feel completely at home by the chimney-corners of the comfortable rooms Messrs. George & Peto have devised for them. The buildings are a combination of brick with half-timbered bay-windows and gables; the richer parts admirably contrasted with the plainer work; all such features as porches and chimney stacks being made the most of by design, at all times good, and never strained or overdone. No. 1084 is a very careful restoration of Knowle House, Wilts, by Mr. R. H. Carpenter, interesting as a specimen of sixteenth century work of a very English type. In No. 1092, a design for alterations and additions to St. Mary's Church, Monmouth, the first of Mr. Street's contributions meets us. If we had to regret the absence of Mr. Street's brethren of the Academy we must admit he has tried to make up as best he could for their shortcomings in this respect, as he has no less than six drawings on the walls. He thus takes a very liberal advantage of his privilege, and though some of the works are not perhaps of the importance expected from an artist of Mr. Street's high position, they have all his charm of manner, in both design and drawing. Still they are not without faults, perhaps arising from that very manner which is their chief characteristic. We see it in the alterations to the Monmouth Church, where the additions savor more of the Continent than is good for the very English-looking tower and spire of the old church. Again, in No. 1143, a view of St. Margaret's Home, East Grinstead, where the tower of the chapel, which is almost too small for a tower and too large for a turret, is very Frenchy, and not by any means worthy of the chapel to which it belongs. And yet what a wealth of design and beauty of drawing is to be seen in this same St. Margaret's. The Guests' House, the Sisters' House, the Lodge, the Chapel, with the various courts and alleys, grouped with a most masterly hand, all tell of consummate knowledge and artistic skill of the highest order, — and still withal there might be a little more homeliness about the buildings, with advantage to the general effect, not to mention the inmates. Then in No. 1107, we have Mr. Street's church of Holmbury St. Mary, Surrey, a pretty country church, excellent in design and drawing; in No. 1158, his spire of St. Peter's Church, Bournemouth, perhaps the most English-looking tower and spire he has lately done; and in No. 1174, his houses in Cadagon Square; the latter are severe, almost conventual, in style, in striking contrast to the Queen Anne mansions alongside of them, — as if in vigorous protest against the vagaries of our latest revival. All the same, the

latter look the most comfortable to live in and better suited to the wants and requirements of the day. With Mr. Street's works must close our notice for the present. The display on the whole is an encouraging one, and there are several excellent designs yet to be mentioned: notably Mr. Norman Shaw's diploma work; his view of Adcote in Shropshire, the most artistic piece of work in the room, and about which we shall have a few words to say in our next notice.

NEW APARTMENT-HOUSES.

NEW YORK.

A LONG time ago the *American Architect* pointed out the importance of a careful study of the problem of concentrated residences, so to speak, or of making the most of the ground for purposes of dwelling. High and low in society are alike to be provided for in this way. The Five Points has its compact system of tenements, while on Fifth Avenue one sees here and there, from one end to the other, great piles called sometimes by the name of hotels, and in other cases more openly apartment-houses. With the social and sanitary problems involved in these houses we have now little to do. Architecturally there is much to be done before these structures shall express themselves as dwellings without, while they meet adequately and satisfactorily a dozen requirements within. It is peculiar that in the erection of the best class of such houses in the city, the most staring and vivid designs are the most popular. Owners of this class of property are very sensitive in the matter of securing the favor of their tenants. Those who were willing to be lost in the common run of brown-stone fronts when keeping up a separate establishment require, when they look about them for a French-flat apartment, an exterior which to their eye is palace-like. It must be gorgeous, as they interpret the word. It may have a thousand faults, may be inconvenient, cramped, and in some degree unhealthy, but given a few showy items which may be seen at a glance, then all is well. An honest pine or ash finish would be regarded with contempt beside a veneer, conglomerate of cheap mahogany and poor walnut. Brownstone there must be, even if it be but skin deep. A staring metal cornice, too, is considered infinitely superior to a legitimate one in brick or stone. There may be skin-work in the kitchen provided there be plenty of sham grandeur in the parlors. Although there are thousands of people living in this class of houses in this city today, not one of the great piles can boast of honest rolled-beams in the floors, with arches turned in brick. These are not seen, and, of course, are not to be considered in the distribution of the building fund. In public buildings we get some merit. In banks, theatres, warehouses, factories, and churches, the architect is permitted to dictate in a measure the character of the building, but in apartment-houses a cheap gorgeous model has been fixed in the public eye, and follow it the owners will, and follow them the architects must; so that New York has yet to see an apartment-house where the architect has not had, from the very start, this wretched New York ideal kept always before him.

Wm. Field & Son have made a specialty in some measure of apartment-house and tenement designs, and have secured admirable arrangements on the flat, but outside of the plan they wisely, for their pockets' sake, attempt little. The model tenements have been a great success in Brooklyn, and now New York is to have a small one on a plot, 88 feet by 70, at the angle of Corlears and Monroe Streets. It is near the old "Hook," with a good river view. The essential features of the White or Brooklyn houses will be followed in the new block, which is owned by Jackson S. Shultz, the well-known leather merchant. The staircases will be in a tower, with each landing open to the air, built between brick walls, with slate treads and risers and open at the bottom and front to the air. There is no possibility of the stairways becoming a nuisance, nor of the halls becoming a conduit of bad air and foul smells. The balconies leading to the actual room doors are open to the weather in every way, and each door of an apartment, or set of apartments, opens direct to the open air. Each set of apartments has its own water arrangements, and in this edifice, which is five stories high, or sixty-five feet to the cornice line, a set of two or three rooms may be rented for $100 per year, on an average. It is the first of the model tenements in New York, and with care and discrimination in selection of tenants, its success may lead to the erection of many others.

For quite another section of the city Messrs. Field & Son have prepared plans, under direction of Judge C. P. Daly, for a flat house to cover a 50 by 108 feet plot, facing the Central Park from Fifty-ninth Street, with a brick front and elaborate Belleville stone finish. The front is seven storied, and the building will be as fair, architecturally, as any of the cordon of fine residences now drawing about the Park sides. The building is lighted by a recess or well, 12 by 40 feet in area, extending into the building from the south or rear side. This will throw plenty of sunlight into all the rear rooms, while the front will have the Park prospect. The usual elevator and dumb-waiter arrangements are preserved.

At the northeast corner of Fifth Avenue and Forty-second Street, across the avenue from the great "Bristol" flat which the late Griffith Thomas designed, Messrs. Field & Son are to build an apartment-house for Levi P. Morton, whose fine residence is to be demolished to make room for the structure. The plot has a frontage of 27 feet 5 inches on Fifth Avenue, and runs 133 feet along Forty-second Street, and at the easterly end an L, 24 feet wide, runs back 71 feet from Forty-second Street. The site is worth $100,000, and the building is to cost $210,000, since in it nothing is to be spared in securing a thoroughly first-class construction. The building will be seven stories high, or ninety-five feet to the cornice. The plan seizes the opportunity of this prominent corner to carry an angle bay, while other bays break the long front. The first floor will be given up to parlors, the idea being to make it in a measure a "suite hotel."

In all three of these buildings the same criticism holds, that the elevation was made to suit the fancy of the owner or prospective tenant, rather than the real requirements of the problem. The tenement-house is the best of the trio, because here elevation in most respects grew out of the construction of the plan, and the finish was honest and direct, without pretension and with no intention to make things appear other than they are.

W.

ROMAN ANTIQUITIES AT LYDNEY PARK, GLOUCESTERSHIRE, ENGLAND.

THE account of the remains at Lydney Park, recently published,[1] is an interesting addition to the printed records already existing of the works left by the early occupants of this country. When the Roman constructions in Lydney Park were first regularly explored (at the beginning of this century), the Right Hon. C. Bathurst, after taking accurate plans and drawings of the several rooms as they successively came to light, composed a detailed description, in two parts, of the villa and the temple. His work displays much knowledge of ancient history and antiquities, is well arranged, and written in a good style; but it has been considered as carried out to too great a length, and too discursive, for the purpose of the present publication. Others have therefore worked upon it, and the whole has been edited by Mr. C. W. King, who has added some theories which greatly increase the interest attaching to these remains.

No regular investigation of these remains was ever made until the year 1805, when some holes having been dug for the purpose of planting trees, which brought to light the foundations of old walls, it was resolved by the late Right Hon. C. Bathurst, who then owned the property, to continue the excavations, in order to trace out the direction of these walls, and the form of the building to which they belonged. This work was carried on for several years, one workman only being usually employed upon it. Every wall was measured as it was brought to light, and laid down on paper; and every pavement was carefully copied, until the whole range of buildings had been discovered.

It would appear from the extent of the buildings, the elegance of some of the pavements, the hypocausts, and the painted stucco with which the walls were adorned, that if this spot was first occupied as a military station, it gradually became the settled residence of a number of persons who gathered around the dwelling of the proconsul, or other officer of high rank.

The series of coins found here, extending from Augustus to Arcadius, would lead to the conclusion that this station was occupied during the whole period of the Roman dominion in Britain, while the large number of them would seem to show that the place must have been vacated in haste; and the marks of fire, with pieces of melted lead found among the ruins, make it probable that the whole was suddenly destroyed, and never again occupied by the inhabitants of the country.

The buildings extended nearly in the direction of north and south, entirely across the hill, the extreme walls on either side standing on the edge of the declivity. The whole breadth in this direction was three hundred feet; the utmost length across, nearly east and west, was three hundred and fifteen feet.

The hypocausts found were merely to warm the various apartments; there are no indications of baths. This, says Mr. King, in another part of the book, was the usual method for warming houses of the better class in cold climates, for the Romans were not acquainted with the use of fireplaces having chimneys; the focus of poorer dwellings being simply a fire made in the middle of a room with a hole in the roof above for the escape of smoke. Julian, in his "Misopogon," tells a curious story that well illustrates the custom. Residing in Paris during a very severe winter, he would never allow his bedchamber to be warmed, "although this could have been done by means of fire under the floor, as the houses in that region are generally constructed." But the frost growing still harder, he was forced to submit; but fearing lest heating the flues suddenly should bring the damp out of the walls, he ordered a brazier of live coals to be carried in, and narrowly escaped suffocation from the fumes.

One of the buildings exposed is supposed to be the remains of a temple, the extreme length of which is ninety-three feet, the breadth seventy-six feet. The remains of such buildings in Britain have not been very frequently found, though altars inscribed with the names of various deities are not unusual. Yet it appears to have been a part of the policy of the Romans, when establishing their authority over the British tribes, to promote the erection of these, as well as other public buildings. We are told by Tacitus, says Mr. Bathurst, from whose account we are condensing these particulars, that Agricola took great pains to encourage the building of temples, public

[1] *Roman Antiquities at Lydney Park, Gloucestershire.* Being a Posthumous Work of the Rev. William Hiley Bathurst, M. A. With Notes by C. W. King, M. A., Fellow of Trinity College, Cambridge. London: Longmans, Green & Co. 1879.

rooms, and private dwellings, in order to civilize the natives, and deter them from their warlike propensities. It is believed that this building was a temple, from the circumstance of three inscriptions having been found within it, two of which are on bronze plates, the third on lead. These are evidently votive tablets, and were probably suspended, or nailed to the wall, in some part of the building.

It is remarkable that in each of the tablets now under consideration the name of the god is spelled differently. The execution of one of them, however, seems superior to the others, besides that the writer of it has a *prænomen*, and may, therefore, be supposed to have been of higher rank and better education than the others. So that, taking his reading as the most correct, it is concluded by the writer that this temple was dedicated to a god named Nodon or Nodons.

The tablet of lead bears a curious inscription, which may be thus translated: "To the god Nodens. Silvianus has lost a ring. He has given the half part to Nodens. Allow health to none amongst (those) who bear the name of Senicianus until he brings (it) even to the temple of Nodens."

The question naturally arises, whether such a deity as Nodons or Nodens was ever heard of in Roman mythology, and this is discussed at some length. Was he, it is asked, a British divinity, adopted by the Romans, as they sometimes were in the habit of doing in regard to the gods of the countries they conquered? Examples of this may be seen in the inscriptions on Roman altars found in Cumberland.

Another conjecture identifies Nodon with Æsculapius, the god who presided over the medical art, and whom the Romans borrowed from the Greeks.

On the dedicatory inscription, which is of peculiar interest to us, worked in the tesselated pavement of the Temple, the copies hitherto published are supposed to be very incorrect in the first and last portions. They give for the opening four letters no more than D. or D. A., and read the concluding letters as INTERAMNATE. But now, with the aid of the accurate drawing made at the time of its discovery, some additional forms can be with certainty restored, and the whole, Mr. King thinks, may be read as follows : —

"D*eo* M*aximo* IT*erum* FLAVIVS
SENILIS PRA*eses* REL*igionis*
EX STIPIBVS POSSVIT
O*pitu*LANTE VICTORINO INTER-
prete L*atine*."

"To the greatest God, for the second time, Flavius Senilis, Head of the Religion, has erected this, from voluntary contributions, the Director of the works being Victorinus, interpreter for the Latin tongue."

Victorinus, Mr. King thinks, was clearly a man that could turn his hand to anything; like Juvenal's half-starved Greek, he was, as circumstances demanded, —

"Augur, schœnobates, geometres, pictor, aliptes,"

and shone in every capacity.

To his taste and skill the numerous tesselated floors of the villa, with their graceful and varied patterns, bear ample testimony, and lead us to form a high opinion of the temple that rose up under his direction (although nought of its architectural features now survives), pillars and entablature having (as the absence of even their fragments proves) been constructed of oak. — *The Builder.*

THE GRAND CENTRAL DEPOT ROOF AGAIN.

New York, May 15, 1879.

To the Editor of the American Architect:

Sir, — Notwithstanding the letter of Mr. O. P. Hatfield in your issue of May 3, respecting the part his brother took in the construction of the roof of the Grand Central Depot, I reiterate my statement that Mr. Joseph M. Duclos was the sole designer and constructor thereof. He has the documents necessary to prove his title as the architect of the work. I would ask Mr. Hatfield what he has to show in substantiation of his assertion. Respectfully, H.

NOTES OF EXPERIENCE AND INEXPERIENCE.

23. Red Mortar. — Red mortar is often made from various substances, such as brick-dust, red earth, and some of the pigments, but the most durable is made of a fine grade of red oxide of iron which retains its color and does not fade. The best way of mixing it is to grind it in distemper and then add to the mortar, which can be made of any desirable color, from light pink to dark red.

NOTES AND CLIPPINGS.

Accident. — One can hardly believe the newspaper report of an accident which happened in Elizabeth Street, New York, on Friday, May 23. It is stated that a four-story brick tenement-house was in course of demolition, the walls having been taken down to the level of the first story floor, and "most of the bricks were piled on the frail and rotten boarding which formed the floor," thus forming a man-trap of the most vicious kind, which found its victims in four of the score or more boys who were picking up chips among the rubbish, at the time when the main girder broke and let everything drop down to the cellar. As the boys were on top of the bricks, and not in the cellar, they escaped with their lives, though not without serious injuries.

A German School of Art at Rome. — The German Government has bought a palace on the Pincian Hill in Rome and has fitted up therein fourteen ateliers and a certain number of lodging-rooms, where German art-students may pursue their studies after the manner of the French students at the Villa Medici.

The Albert Medal. — The Council of the Society of Arts has awarded the Albert Medal to Sir William George Armstrong, C. B., D. C. L., F. R. S., "because of his distinction as an engineer and as a scientific man, and because, by the development of the transmission of power — hydraulically, — due to his constant efforts extending over many years, the manufacturers of this country have been greatly aided, and mechanical power beneficially substituted for most laborious and injurious manual labor."

The Discoveries in the Farnesina Gardens, Rome. — A correspondent of the New York *Evening Post* writes as follows concerning the newly discovered palace in the Farnesina Gardens which was described in our last issue : —

"I had arranged to visit the excavations with the Director General of the Hydraulic Works of Italy, but an unexpected rise in the Tiber having covered the mosaic pavements, and the rare paintings on the walls having already been removed, I am obliged to accept the description of another. The frescoes on the walls have been taken to the magazine of the Archæological Commission in the Convent of Saint Francesca Romana, but they will soon be placed in the Museo Kircheriano in the Roman College. Those persons who have not seen them in their original position will there be able to examine them at their leisure. Professor Lanciani in his lecture in the University of Rome, last Wednesday morning, discoursed on the antiquities in the bed and on the banks of the Tiber, and said he believed this house was formerly dedicated to the sale of wine. All establishments of a similar kind were anciently in the same quarter of the city, and it may be that this was one of many houses in that part of the city where the delights of Bacchus were enjoyed by Romans. The archæologists say that no discovery of equal importance has been made for centuries in Rome. The walls, first covered with a thick coating of powdered marble, are ornamented with exquisite paintings in a perfect state of preservation. They were evidently made in that period of Rome at the end of the republic or the beginning of the empire, when the art of painting was in the greatest perfection. One of these pictures is an exquisite representation of Bacchus as a child. Near this are two imitations of the ancient style, and there are also two musicians playing the cithara. This is an instrument resembling the modern guitar in form as well as in name. An antique bas-relief in the Hospital of San Giovanni in Laterano also represents this ancient instrument, with cords and frets like the guitar. The cords, however, are longer and the space for the frets smaller, while the player held the thick part of the instrument in the curve of his arm. The Egyptians also used this instrument, and a picture of a man playing upon it is seen in the tombs of Thebes But this new representation of the cithara has a value which none of those discovered previously possess. Over each cord of the instrument are seen certain letters or signs which are believed to be notes, and if the learned men of the city succeed in reading them we may be able to hear a melody composed two thousand years ago and sung by the merry followers of Bacchus on the shores of the Tiber. It is very probable that in continuing the excavations other rooms will be discovered. Those already found indicate the usual form of an ancient Roman house, which consisted of an interior court, which was open to the sky, surrounded by columns, and to which the rooms inhabited by the family had access. The bases of three columns are seen here, and beyond these is a corridor one hundred feet long and eighteen wide. The room where the paintings were found is on the right of this passage."

The Medallic History of the United States. — As we have not seen the magnificent work of Dr. Loubat, illustrated by one hundred and seventy etchings by M. Jules Jacquemart, since only a small edition was published, we can only speak of it by hearsay, and cannot do better, perhaps, than to repeat a part of what the *Portfolio* says of it. "The collection is complete as a representation of American medals up to date [1878] of publication, and is of great historical interest. A medal voted by Congress is the national honor which in America is the substitute for peerages and orders of knighthood. If the number of recipients is taken into account, it will be evident that such a medal is in fact a far higher expression of national appreciation than anything we have in Europe, except the thanks of Parliament. Only eighty-six medals have been struck by order of Congress, in the course of a century. How many peerages and orders of knighthood have been bestowed even in England (a country not prodigal of honors) in the same space of time! The Legion of Honor is a much more recent institution, yet the number of its recipients may be counted by hundreds of thousands. The work done by M. Jacquemart is simply perfection. We cannot help feeling that when he undertook this enormous labor M. Jacquemart engaged himself, as people do in marriage, 'for better and for worse.' Some of the medals are fine works of art in themselves, others very much the reverse. An action may be noble in itself, and yet a medallist, embarrassed by the conditions of an art which is full of pitfalls for the unwary, may interpret it in such a manner as to make an absurd work of art. Again, nature herself may serve him a bad turn. He has not the choice of the portrait painter; he must exhibit all his faces in profile, and many men of high character and great ability are very unfortunate in their profiles. It is impossible to repress a smile at the angle made by the nose of John Quincy Adams with his forehead! The funniest of the funny medals is that given to Mr. Cyrus W. Field for establishing the Atlantic Telegraph. Mr. Field's head is flying like a bomb at a considerable height above the ocean, and smoke is issuing from the lower part of the neck where the fuse appears to be situated. Below him a terrestrial globe is cut in two halves, like a chain-shot, and we have actually the chain connecting them. It is a comfort to see the halves properly united again on the other side of the medal. It is much to be regretted that nearly all these medals are much injured, artistically, by tasteless lettering. Modern coins and medals are constantly spoiled by vulgar lettering wrought with only too perfect mechanical skill. Antique medals escape this evil, partly because they had far better taste than the moderns in drawing the letters themselves. Real antique Roman lettering, though not nearly so regular as modern type, is seldom if ever inelegant, and the rude letters on Greek coins only make us feel the admirable designing of the heads and figures."

Glass Floor-Tiles. — A glass manufactory in Hanover, Germany, makes glass which is a close imitation of marble, and tables and floor-tiles made of it are preferred to marble on account of their hardness.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, JUNE 7, 1879.

CONTENTS.

THE Chicago Custom-House Trial drags slowly along as we write. One or two supplementary witnesses called in by the Government have failed to offer any testimony of significance in the prosecution. The testimony of the defense has been occupied with maintaining the good character of the defendants, or impeaching that of the witnesses for the prosecution, and of rebutting as far as might be the complaints against the stone of the building. It was in evidence that the stone suffered from being set in the building before it was properly seasoned as well as from want of proper protection after setting, and the point was made on behalf of the contractor Mueller, that he had been forced against his judgment by the pressure of the Supervising Architect, Mr. Mullett, to furnish and cut it while it was yet green and its final behavior undetermined; also that while work on the building was interrupted during the investigations of 1875, he had asked permission to go on quarrying stone for the building in order that it might be seasoning for use, which was not allowed. A former superintendent of the Supervising Architect's office, Mr. Oakshott, who had been called upon once or twice to inspect the building during its progress, testified that much injury had probably been done to the building by setting the stone, which was done unskilfully, and in such a way as to expose it to deterioration. Other witnesses went further in this direction, declaring that the stone was so badly set as to admit water into the joints, bringing to the surface stains that would not otherwise have shown. Some declared that the building had seen its worst days and would improve from year to year as the stone got thoroughly seasoned; and some went so far as to declare that it was already the finest building that had been built of sandstone. Another point raised was that the stone having been accepted in the rough by the Government according to its contracts, before its quality could be fully seen, it was not until it had been cut at a large expense that many of its defects became visible, and then it was a question of sacrifice by throwing it away, cutting and all, or of patching and retaining it in its imperfection, the inspectors being especially notified that since the loss was the Government's they should be cautious in rejecting such stone. The contractor Mueller, testifying in his own behalf, supported these allegations, declaring that he had tried to put his best stone into the building that it might be a monument to himself. He further testified that instead of enriching himself by his contract, he had embarrassed himself, having expended large sums in plans for its execution and suffered greatly from delays and interruptions of the work, which with the costly and vexatious lawsuits that it had brought had actually impoverished him. In answer to questions of the prosecuting attorney whether his impoverishment did not come from having to divide with his confederates, he denied this utterly, but claimed that efforts had been made to blackmail him, notably by one Hibbard, who had brought suit for payment of fifteen cents per foot on all the stone he furnished for the building.

A CORRESPONDENT has sent us a copy of a rather remarkable sheet of "Instructions to Architects," offered by the Board of Regents of the University of Michigan. It bears the subtitle "Designs for a Museum Building for the University of Michigan," saying that designs are to be submitted under motto, and will be received until noon of June 23, and adds that the Regents reserve the right to reject all designs. Further than this there is no mention of any terms of competition. Architects are instructed to furnish four elevations, plans of each floor and roof, with two sections at right angles, all on the scale of four feet to the inch, and enough full-sized working drawings to explain the construction of their building. They are also to furnish specifications, with schedules of quantities and prices, sufficiently full to show the mode of construction and cost of completion, even to plumbing, gas-piping, and steam-piping, and they are expected to guarantee the execution of their designs for the limit of cost fixed by the committee. Instructions that would help in planning the sort of building that the Regents want are conspicuously absent, the only indications of what is wanted being in the requirements that the building shall be fire-proof, with floors of brick and iron; that it shall contain ten thousand feet of floor space, and cost not more than thirty thousand dollars; and that it is to be used exclusively for scientific collections. There is no hint of the kind, size, or subdivision of the collections, nor of the manner in which the building is to be adapted to them, nor of the number of rooms, nor of the amount of the plumbing or gas or steam piping for which the architect is to furnish and guarantee an estimate. The programme is, in short, one which would do for a school exercise, but not such as we should expect from a body of men who knew what they wanted and what they could expect. Yet it comes from the Regents of the principal university of the West, and concerns a particular kind of building for a specific use of which they, and they only, might be expected to know exactly the requirements.

IT is worth while to consider what this sheet invites, and what it offers in return, because there is a presumption, from the position of its authors, that they are more intelligent and considerate than the average building committee. It invites — if it can be said to invite anything — from architects who may respond to it a study of a design for a special use, — a use which it may be presumed is new to them, and of which the requisites are unknown to them, since they are apparently unknown even to the persons who are to use the building. Their study must be careful and minute, for they are to guarantee the cost of their buildings. They are instructed to furnish each a dozen sheets of working drawings, with specification, bills of quantities, and price-lists, which have got to be prepared with a great deal of care. These things, if they are well and thoroughly done, will make an expense for draughtsmen's and clerical labor of probably not less than two hundred and fifty dollars, apart from the labor and skill of the architect who designs them, which ought to count for twice as much more. In return for this presumable expense of money and labor the programme offers really nothing. It implies only that if any one of the architects who are expected to answer it is lucky enough to please the Regents he will have a chance of becoming the architect of their building under the unreasonable and unprofessional condition that he guarantees the cost of it, but the circular takes pains to say that this may not happen. It implies that the Regents expect to get plans from architects, for they would not issue such instructions for no purpose. One might argue, indeed, that they expected to be beset by architects, and had issued these instructions to repel as many as possible, and relieve themselves of an *embarras de richesses*. But it is probably issued in good faith, with the expectation that it will attract designs, or rather perhaps with the feeling that there is a fatal attraction in every remote chance of a "job," even a small one, — for this is not one of the prizes of the profession, — that such instructions cannot neutralize. There is an attraction, no doubt; but it is one to which it is rather perilous to appeal. The men in the profession to whom a judicious client would naturally turn for work of importance are not accessible to it. Those to whose services experience has given value, who are too conscientious to slight their work, and whose labor is too valuable to be wasted, are in fact likely to be pretty effectually deterred by such a manifesto. Its appeal will rather be to the unemployed and the irresponsible, the struggling beginner, or the needy adventurer of the profession, and we cannot help wondering that its projectors should expect to attract others.

IT is a good deal the habit of architects to complain of the want of consideration shown them by building committees, and although the case we have described above is an extreme one, it is true that such committees are not apt to show much respect for the profession as a profession, nor any high estimate of its

services. They treat it in fact not so much as a profession whose best service they would labor to secure as one whose attendance they can always command, or even against whose officiousness they feel it necessary to be on their guard. That under these circumstances they should rate an architect's time and labor as of much value is not to be expected. Men do not value what they can have for the asking, and it makes no great difference if instead of mere asking they have only to offer the inducement of a small chance of employment. Eagerness spoils its own market, and if architects are conspicuously anxious to offer their wares whenever there appears a possibility of acceptance, it is no wonder that they are cheapened; nor is it strange that inexpert customers like committees do not stop to inquire very carefully whether the wares that are temptingly displayed are the best they could get or not. If this condition of things is encouraged mainly by inferior practitioners, it is not altogether so, for the speculating propensity is contagious, and many of the better men in the profession are inconsiderate enough to confound themselves now and then with those of a lower grade, and lend a hand in competitions that are damaging to architects. It is of no use then for architects to relegate the responsibility to committees, and rail, like the disappointed architects in the Indiana State-House competition, at the treatment that may be given to them or their work. If they offer their cheek to the smiter, the merest school-boy pluck should teach them to refrain from whimpering when they feel the smart of the blow. It is idle to expect outside persons to charge themselves with upholding the dignity or exalting the records of our profession. It is not in nature that any committee should set a high value on the services of those whom it sees hanging on its favor, ready to work laboriously and long for the mere chance of being the lucky one to get some compensation; nor when any considerable number of the profession yield themselves to contemptuous handling need we expect that committees will be very exact to discriminate the inferiors who submit from the superiors who resist.

THE Interoceanic Canal Congress has ended its sessions, and came to a conclusion that was altogether unexpected, at least to the friends of the canal on this side the ocean. The discussions had, as we said last week, narrowed to the question of advantage between some short and direct sea-level route to be achieved only by tunnelling through the mountain ridge, and a longer high-level route, avoiding the tunnel and crossing the divide by more or fewer locks; the first system being difficult and costly in construction but quick and cheap in transit, the second long and troublesome in operation but much cheaper in construction; the first the system favored by the French delegates, under the lead of M. de Lesseps and Lieutenant Wyse, the second that of the American delegates. When we last wrote it was clear that the report of the Committee on Technique, whose figures, by the way, appear to have been wrongly quoted, together with Sir John Hawkshaw's argument, had given a death-blow to the San Miguel scheme of Lieutenant Wyse and M. de Lesseps, and the report of the New York *Herald*, the only account of any completeness that has yet been received here, encouraged Americans to believe that one of the American routes would be selected. But the French engineers appear to have urged their ideas vigorously upon the Congress, under pressure of its appointed adjournment, and, giving up their San Miguel project as defeated, to have united on a modification of the Panama route, favored and perhaps suggested (on the spur of the moment, the *Herald* correspondent intimates) by Lieutenant Wyse. To this plan the Committee on Technique was induced to give its support, offering in the last hours of the Congress resolutions which recommended that the sea-level route from Colon to Panama be adopted. These resolutions were adopted unhesitatingly by the Congress, with hardly any dissenting votes; but the American delegates, who had been so taken aback by the unexpected turn of affairs as to be unable to offer any effectual opposition in debate, refused to take part in the final vote.

THIS rejection of the American projects, although it was coupled with many compliments to the American engineers, seems to have annoyed our delegates greatly, and has been received by newspapers on this side as if it were a national affront. The *Herald* thinks that Americans will not tamely acquiesce in such a judgment, and that it is with America alone that the final selection of an interoceanic canal route must rest. The *Tribune* does not expect Americans to view with composure the decision of the Congress, and reminding them that the scheme is substantially that proposed thirty years ago "by a needy adventurer, in London, named Louis Napoleon," and was pressed upon the Congress by another member of the Bonaparte family, thinks American investors "will not be likely to forget the slight which has been put upon American engineers at Paris." Al this strikes us as curiously beside the mark. The French theory has, to be sure, in a purely advisory congress, carried the day against the American. The French engineers may or may not have been moved by pride of country or partisan spirit; but the questions at issue are questions of engineering and of business, with which pride of country has really nothing to do. The reports of the *Herald*, though voluminous and intelligent, are written with too much patriotic *animus* to give any clear idea of the general feeling of the Congress. The Congress, however, was a large body convened from a great many nations; its all but unanimous final vote of seventy-four to eight can hardly be attributed to partisanship, but shows that the theory of a short sea-level canal, for all its cost, was decidedly approved. In a general view this seems a reasonable approval, and it matters nothing by whom the theory was brought forward. A ship canal, like a great through railroad, is a bold and expensive device for an enormous ultimate saving of time and labor, and is one of the things in which half-way measures are likely to be unsatisfactory. So far as the United States has an interest in this one, different from that of other nations, it is in saving coast distance by a canal farther north. But the Tehuantepec route, which alone meets this condition, would require one hundred and twenty locks and a twelve days' transit. It was not thought worth while to make estimates of its cost, nor did the Americans advocate it. Among the other routes the difference in remoteness is so unimportant that with the Americans the next favorite to the Nicaraguan, which is nearest, was Selfridge's Napipi route, which is the most remote. The time of transit computed was four days and a half by Nicaragua, three by the Napipi, and one and a half by Panama. A day's sailing through locks in a canal, we may remember, is a very different thing in the way of cost from a day in a sea voyage. As Americans, or as cosmopolitans, we may believe with comfort that when it comes to building the canal, in which the whole world has an interest, its location will be determined, not by an advisory congress, nor by patriotic pride, nor by boyish resentments; but by the enterprise and sagacity of capitalists and the skill of engineers.

THE Bennington Battle Monument Association goes about its work in a way that may be commended as in some respects exemplary to other associations which have monuments to build. It has decided, in the first place, that it will not begin building until it has the money on hand to finish its work. It has received grants of money from the three States whose forces were concerned in the battle, Vermont having contributed fifteen thousand dollars, Massachusetts half as much, and New Hampshire five thousand. It is hoped to raise as much more by private subscription, bringing the whole amount up to seventy-five thousand dollars, of which at present something like forty thousand is secured, we are told, including the state grants. In the mean time the Association wisely refrains from committing itself in haste to any design, and has voted that none shall be accepted which has not received the unanimous vote of the directors. How easy it may prove to secure such unanimity remains to be seen, but the Association will undoubtedly find its account in its policy of a deliberate choice. We have more than once had occasion to lament the ill success of American public monuments, and this ill success is due to nothing more than to haste in selecting designs. A design is easier to get than the money, and is thought, moreover, to be an admirable appliance for raising it. One is therefore selected, commonly with very little consideration or effort at enlightenment, as soon as an association is formed, and a picture of it is hawked about in search of subscriptions. This works badly in more ways than one. The design thus hastily chosen is very likely, like that of the Washington Monument, to be a mortal incubus on the scheme. At the best it is apt to become stale and discredited in the effigy long before there is opportunity to embody it, and when interest in the subscription flags there is no new interest to fall back on. But the main danger is in the choice. To get a good design for a monument, in our time and country, is not an easy thing: if the choice is made hastily, it is pretty sure to be made badly; if it is made with painstaking deliberation, there is, at least, good opportunity to sift out unsuitable designs, and a chance for the employment

of expert counsel, without which it is very easy for the inexperienced to go astray. We may trust that the caution of the Bennington Association will save theirs from the too common fate of such enterprises, that of building a monument for which nobody cares when it is finished.

ON THE RELATION OF ARCHITECTURE TO UNDERWRITING.[1] II.

SHEET metal in all forms should be sparingly used on first-class fire-proof structures. The principal uses made of it for constructive and fire-protecting purposes are in floor arches, as before mentioned, lathing to support plaster, and for roof coverings. Lathing with sheet-iron is not used as much as formerly. If intended as a support for plastering, which is calculated to do any service as a protection against fire, it is open to this objection: the absorption of enough heat through the plastering to expand it to the least degree is liable to cause undulations, which will throw off the rigid and brittle plastering. It is also liable to decay through the action of sulphate of lime in gauged mortar, and it admits spaces, which fire may traverse, behind the plastering. Sheet-iron roofing is valuable only as a weather covering, and should be used only over a roof which is thoroughly fire-proof.

When used alone to cover the spaces between purlins it will resist fire neither from within nor from without. Sheet-iron used as a covering for ceilings or partitions has little or no value as a fire-resisting material. It readily conducts heat, and it is almost impossible to secure it so that it will not crumple and become disengaged. Sheet metal used for decorative purposes in cornices and exterior appendages is always destructible with slight heat. It will often lose its proper form from the radiated heat of a fire on the opposite side of the street.

As a general principle it may be assumed that the only building materials that will resist fire sufficiently to protect the construction of a building are those which are solid in their nature and at the same time porous. Porosity gives the non-conducting property and toughness or resistance to fracture. The degree in which porous bodies act as non-conductors depends upon their thickness. All brittle materials and all natural stones are unreliable as fire resisters.

I have now given a brief outline of the qualities essential to a fire-proof building of the first class, passing over many important details. It will be remembered, I assume, that common bricks were to be taken as the standard of fire-proof material for all practical purposes. Lest I may be misunderstood, allow me to add that there is no standard of absolute security under all circumstances. Mr. Schumann, in the paper above referred to, very truly says: "Warehouses, when stored with inflammable matter, even if constructed entirely of brick, but without precautionary subdividing walls forming compartments, will succumb to the heat by reason of the great expansion causing a movement of the walls and ultimate collapse of the floor arches." This is an extreme case, and the proof of it may be seen in every pottery-kiln, which is banded with iron, because, though lined with fire-bricks, it would otherwise burst asunder at every firing.

It may be added that all finishing materials used in such a fire-proof building are liable to destruction, whether they be of wood, metal, or plaster, by reason of the burning of contents; the most that can be attained by the best known systems of fire-proofing — and this is the main thing after all — being the preservation of the constructive portions of a building. Hence all such buildings are subjects for insurance to a limited extent.

The underwriter may possibly be able after considering these suggestions to detect defects in fire-proofing in so-called fire-proof buildings, which will enable him to determine if there is any liability to a greater amount of loss than could be possible in the finishing parts alone. If there is [not], he can reasonably assume that the building is insurable for the greater part of its value. As a general thing any failure in construction in a fire-proof building results in greater loss from a downfall of any part than in one not fire-proof. This is because of the great weight of materials employed, and the greater expense in making repairs.

I will now proceed to make some observations on fire-proof buildings of the second class. These have before been defined as those in which the materials of construction are combustible, but protected from the action of fire so as to become practically fire-proof. This is one of the most important problems for the modern architect to solve, as it involves the art of economic building. The principles involved are the same in both. The object is to limit the cost of the work as far as possible.

Two systems may be followed. One is found in the use of *heavy wood* for all interior constructions, and the avoidance of all concealed spaces which fire may traverse unseen. In such buildings all that is sought is the best facility for quenching a fire before it has had time to materially weaken the structure. Still, a fire in such a building, even if extinguished in its incipient stages, will cause so much damage that many of the heaviest constructional parts will have to be renewed in repairing damages. Such is the system of building sought to be enforced in factories by the mutual insurance companies of Massachusetts and Rhode Island. As the generality of buildings require an interior finish different from these, it is not always practicable to carry out such a system of construction in buildings other than factories, and it is better to combine the interior finish, which is usually plaster, with such fire-resisting adjuncts as may be necessary, in order that the result may be a building in which all the materials of construction are thoroughly protected from the ravages of fire.

It is assumed that in such a structure the same considerations will prevail with regard to the construction of walls, as have been described for buildings of the first class; the only difference being that lighter walls may be used than in a building the very weight of whose materials themselves demands stronger supports. But in warehouses or stores having very long boundary or party walls, a system of internal or external buttressing should be used in lieu of the support usually given by intersecting walls. A convenient opportunity for such buttressing may be found in the building of flues. As a rule the brickwork should not be diminished by the introduction of flues, but an amount equal to that displaced should be disposed on each side of a flue. By this means a natural buttress may be obtained. I adopted this rule while building in Chicago since the great fire, and in one of my buildings which was burned the importance of it was demonstrated; for in this case the walls of a six-story warehouse, with brick cornice, remained intact after the whole interior had been burned out.

It is assumed that the floor beams will be of wood, and as in the case of iron beams, the problem is how to construct a fire-proof ceiling and floor on such a frame-work. The ceiling is the most important part requiring protection, inasmuch as it is exposed to the greater heat, and should resist the natural progress of fire. Floors also require less protection, because the first water thrown into a building will spread over the floors, and there remain until it leaks away or evaporates.

To fill solid the spaces between the beams is objectionable for two reasons: (1) it accumulates too much weight, and (2) it induces danger from decay in the timber. There must be a ceiling and a floor. The ceiling must keep the fire from the beams, and it must be strong enough to carry any weight of water which might fill the space between it and the flooring. Iron laths are expensive, and liable to decay, being made of sheet-iron. Wires are less destructible than sheet-iron, because it is necessary to use wires having more body of metal in them than in the sheet iron that would be used for lath. Wires as a support for plastering may be used in two ways, either woven or strung. It has been found very inconvenient to set up false board ceilings under wires and then fill in from above with mortar, for the reason that the process requires the construction of ceilings before the floors are laid; and therefore it is better to apply the mortar from below. One advantage of wire-lathing over any other is that any desired amount of mortar may be forced through the meshes and above the wires. The amount necessary for thorough fire-proofing is not less than one inch. Two subsequent coats of mortar for finishing will add one half inch, making the full thickness of mortar one and a half inches.

The only other method of constructing economical fire-proof ceilings that I would recommend is found in the various forms of hollow slabs of fire-resisting material, secured to the beams by counter-sunk fastenings, and put together with mortar joints. Those made from one and a half to two inches in thickness, of lime of Teil, plaster and furnace slag in proper proportions, are the best in use. The plastering under such a ceiling adds one half inch to the thickness of fire-resisting material. The best method of deafening floors for fire-protection is, first, to lay a common floor of inch boards on top of the beams, then to nail strips one inch square on top of the boards and over the beams; then to fill the spaces between the strips with one inch of brown mortar; then to take up the strips and fill the spaces thus left with more mortar after the first mortar has dried. The upper floor may then be nailed through the fresh mortar and lower flooring, into the beams, with extra long nails. I have no other system of deafening to recommend. Other systems may be desirable when no dependence is placed on the ceilings to resist fire, but I do not suppose such a contingency to exist, as a proper ceiling should stop the ascent of the fire, and not the deafening. The edges of all floor openings, called aprons, should be treated in the same manner as ceilings.

Roofs may be protected inside and outside in the same manner as floors; but a better method for roofs is to omit the upper course of boards. In such cases the best deafening or fire-resisting material is porous tiles, one inch thick and six inches square, bedded in mortar and nailed to the boards (for all porous tiles can be nailed). The roof covering may be of Portland cement plastering, but if it be of tiles, slate, metal, or composition of any kind, it may be fastened to the tiles the same as if they were boards. This is an especially valuable process for mansard roofs. But mansard roofs should have a further protection, and that is best obtained by filling the spaces between the rafters with hollow blocks of porous concrete or clay, and plastering the whole interior surface. Where this filling is used, boarding is not necessary, and the course of porous tiles can be laid directly on the filling, thus making a uniform covering outside of the rafters, to which the weather roof may be applied.

Considering next in order the more complicated system of interior construction, that in which columns and girders may be required, the problem can be solved with different degrees of safety in the follow-

[1] A paper read before the New York State Association of Supervising and Adjusting Insurance Agents, at Syracuse, May 20, 1879, by Mr. P. B. Wight, architect.

ing ways: By the use of heavy oak columns and heavy oak girders. I say *oak* because it burns more slowly than any other accessible wood. But to insure safety with wood alone it is necessary to use a superfluity of it, to cover the loss of strength caused by the gradual destruction of the outer surface. For heavy loads wooden posts are not desirable, as enormous dimensions are often required when comparatively small sizes of iron would do the work. This is oftener the case with posts than with girders. The next best method for columns and girders is to use combination columns of cast-iron and oak, and combination girders of wrought-iron and oak. In both cases the iron is on the interior and the oak is on the exterior. The slow-burning and non-conducting properties of oak afford the necessary protection to the iron. The iron and oak must be firmly secured together. The best method of doing this, in the case of columns, is to make the casting with flanges radiating from a common centre, and to fill between the flanges with gores of oak which project beyond them, the joints over the iron being filled with plaster, and covered with sheet-iron strips. There are various ways of securing the gores to the iron interiors. Girders may be made by taking an iron I-beam and placing on each side and on the bottom a beam of oak. These beams should be worked to fit solidly against the iron, and should be secured to it by bolts. Such a system of construction readily admits of repairs in case a fire has occurred; for while, when solid timber is used, it is necessary to replace the columns and girders and resort to shoring to hold up the rest of the work, with this system it is only necessary to renew the wooden covering.

If a plaster-finish is required for the whole interior, and a more elaborate style of decoration is sought, it is best to plaster the girders upon porous tiles which have been first secured to them by nails, and to use the same kind of columns as those described for first-class fire-proof structures, which admit of a hard plaster or polished surface.

Interior partitions may be formed of four-inch studs placed two feet apart, filled in with brick and plastered directly on the brick, so as to cover the studs on both sides. But it is better, and little more expensive, to use the hollow fire-proof blocks described for first-class buildings. It is assumed that wherever possible interior partitions will be carried up from the foundations with solid brickwork. All columns and girders, carrying interior brick walls, should be of iron, encased and protected as above described. Wooden furring strips for exterior walls should not be used, but all walls exposed to dampness should be covered with porous tiles on the inside and plastered on the tiles. Interior wooden trusses and trussed roofs should be treated in the same manner as girders.

The possibility of destruction, in such a building as I have described, will be confined to the finishing materials employed, and its extent will depend upon the quantity of the destructible finishing materials. The remarks before made on this subject with reference to buildings of the first class will apply with equal propriety to the second class. It is therefore important that the amount of combustible material introduced in the finishing of such a structure should be severely restricted. This applies especially to the finish around windows. There is no necessity of having any wooden finish around the interiors of windows in business buildings, as plastering can be applied directly to the brick jambs and soffits, and inside sills may be of iron or slate. The box frames for window sashes, as usually made, can always be used for the attachment of inside blinds or shutters.

There are very few business buildings now constructed, in which the system of fire protection I have last described cannot be carried out. The attendant expense will not be great compared with the results attained. Every process mentioned is marketable and attainable throughout the whole country, and all are in use to a greater or less degree.

THE ILLUSTRATIONS.

HOUSE FOR G. H. VAN VLECK, ESQ., BUFFALO, N. Y. MR. M. E. BEEBE, ARCHITECT, BUFFALO.

This house is now building on Delaware Avenue. It is built of brick relieved with the Hulbertun brown-stone, and will cost, when completed, $30,000.

COMPETITIVE DESIGN FOR THE UNION LEAGUE CLUB-HOUSE, NEW YORK, N. Y. MESSRS. McKIM, MEAD & BIGELOW, ARCHITECTS, NEW YORK.

We regret that space does not allow us to show more clearly the arrangement of the various *entresol* stories which form so important a feature of this design: the height of the library and dining-room, twenty-five feet, allowing in the same height the introduction of stories fifteen feet high, with *entresols* ten feet high, as shown in one of the sections. The building would have a frontage of eighty-four feet on Fifth Avenue, and of one hundred and fifty-two feet on Thirty-ninth Street.

The Inland Algerian Sea. — Captain Roudaire reports that fresh water is met with at a depth of thirteen feet below the surface of the isthmus of Gabés, even at the points where this is highest above the level of the sea. Two or three borings have been continued for some thirty feet below this depth, but nothing but sand and marly clays have been met with. Arab labor is plenty at the rate of eighteen cents a day.

YOUNG'S TOWN AND COUNTRY MANSIONS.

This book[1] contains thirty photo-lithographic plates showing various designs for dwelling-houses small and great. They are about equally divided between what the author calls Old English, and the other styles which he enumerates on his title-page. The Old English designs have the picturesque and rather vigorous manner of those in the author's previous book of Picturesque Architectural Studies, which has gained popularity in this country. Broken and gabled roofs, broad mullioned windows, turrets, bow-windows, high chimneys, and low porches are their materials. In the other designs, in the so-called Queen Anne, Classic, Adam's Jacobean, Louis XVI., and other styles, among which we will not attempt to discriminate too curiously, we miss a certain breadth and firmer handling which we find in the first. This indeed is only one more indication of what we often notice, that the ordinary English designer does not improve his chance of success when he steps out of the vernacular Gothic, in one form or another of which his better work is done, into any variation of classic style. We may however distinguish here the design for new houses in Kensington, which has much more elegance of distribution and property of detail than the rest.

The text of the book, which concerns itself very practically with the arrangement and construction of houses, and also the plans which it illustrates, are modelled of course on English habits, and therefore are more or less inapplicable to American wants. But certain habits in English planning which are fairly represented here deserve attention and will be found interesting on this side the water. Moreover, the glimpse it gives of English thoroughness of study in planning, from its own point of view, and of care in construction, makes it worth the reading of many American architects and of other persons who addict themselves to the planning of houses, while the effect upon clients of reading it might be far from unwholesome. It contains many practical suggestions too which will have their use to such people, expressed without literary art, but with conciseness and point. One noticeable characteristic of these, and of other English houses, is the amplitude with which they are planned, in contrast with the contracted stinginess which we see in most American houses, even those which are expensively finished. The rooms intended for company use are planned with an air of elegance and space which to American interiors is almost wholly wanting. Another point is the grouping of the rooms, the development and careful separation of the servants' quarters, things of which American planning, which seeks economy of space and distances at the expense of most other comforts, is apt to be neglectful. The walling off of a kitchen yard, even in a suburban house, is a thing we might learn to practise with much advantage of neatness. On the other hand, some peculiarities of English planning which strike an American as odd are here prominent. There is lack of rooms arranged *en suite*, except drawing-rooms, a curious impatience of symmetry in the rooms themselves, and marked insistance on nooks, corners, and bow-windows, in season and out of season. The habit of lighting rooms from one side only, though two may be exposed, is characteristically English, and lends itself to picturesque effect within, but would be intolerable in any American house which is to be occupied through the summer. In some of the city houses here shown there is a crowding which is quite up to the American standard or even beyond it. The householder, for instance, who among us should try to cram her servants into such quarters as are provided in the mansions in Cadogan Square, or in the Earl of Cadogan's own residence, would arouse an unquenchable rebellion, even if inspectors of buildings did not interfere. Nor would American tenants be attracted by the arrangement of the mansions just noticed, where the kitchen, scullery, and servants'-hall below, and the great dining-room and water-closet beside it above, have their only windows opening fraternally on a small interior well of about six feet by twelve; and where the gentlemen's sitting-room divides its windows between the well which lights the scullery, and a close court ten feet square upon which opens also a window of the stable. We have not consulted plans enough of English city mansions to judge how far such arrangements as these are habitual; but we notice that this free-and-easy relation of the stable is echoed in the plan for another city house of some pretension.

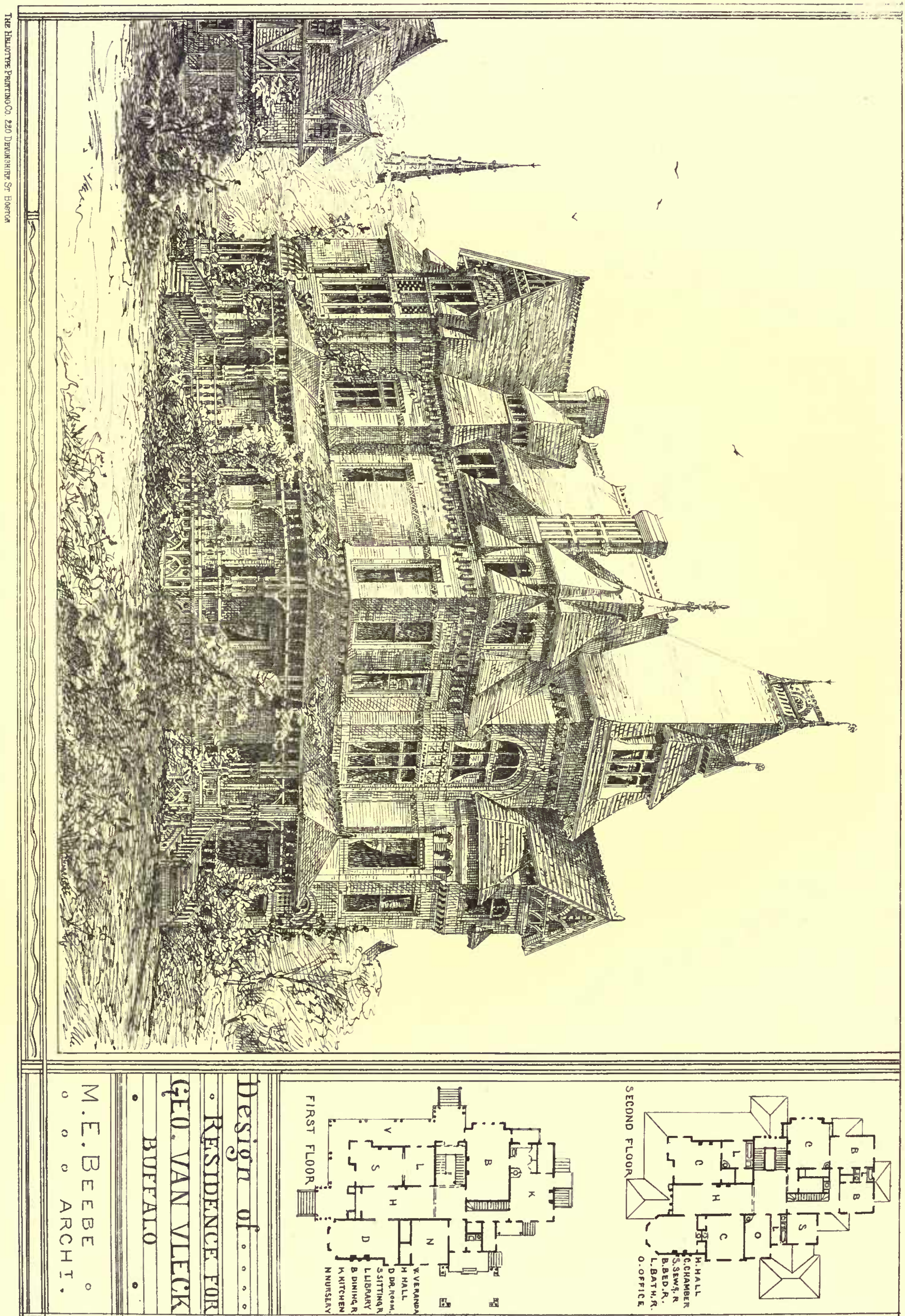
CORRESPONDENCE.

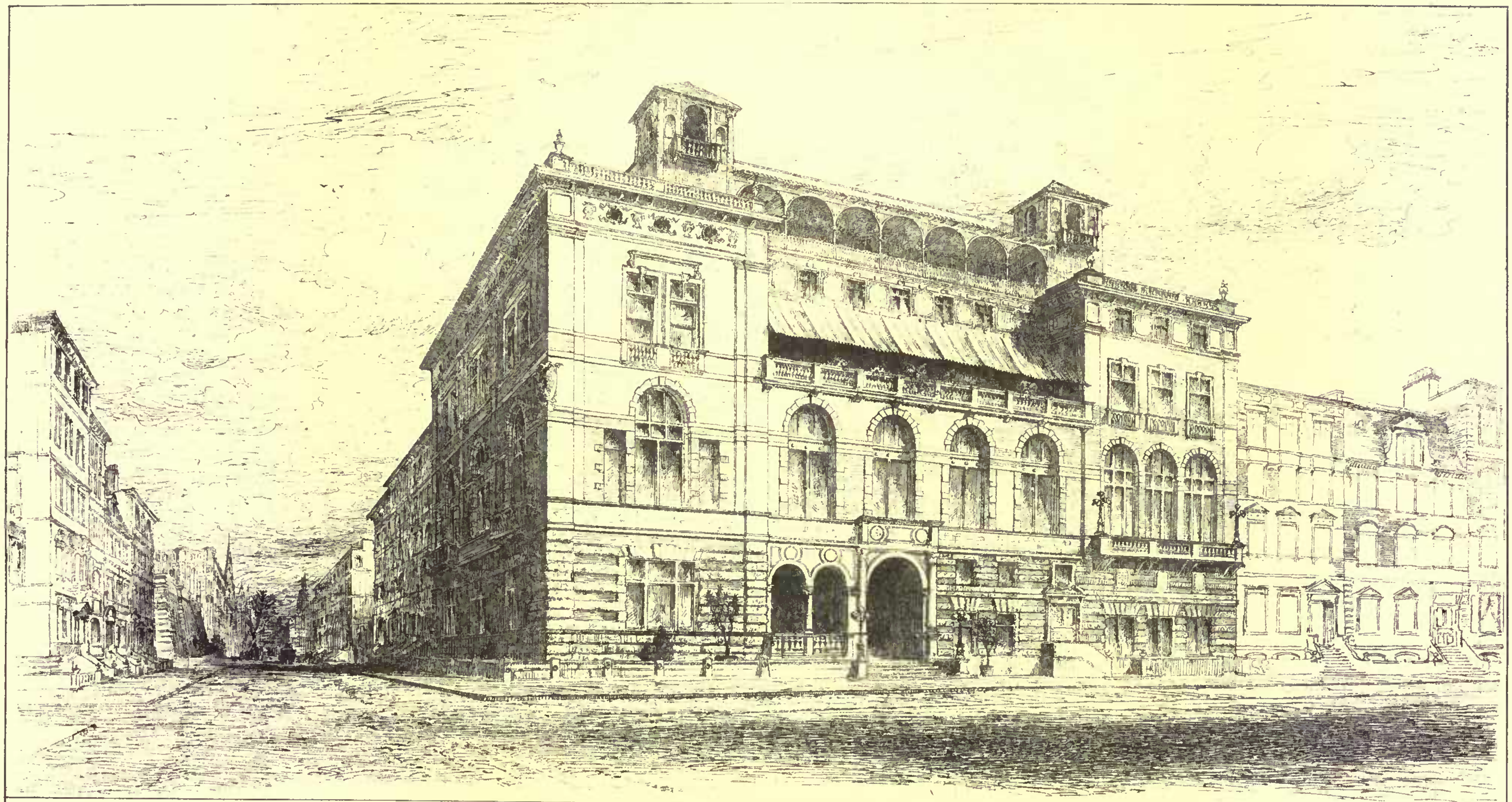
THE SITUATION OF CONSTANTINOPLE. — STA. SOPHIA. — ITS SUCCESSORS AND IMITATORS. — MODERN BUILDINGS. — FOUNTAINS.

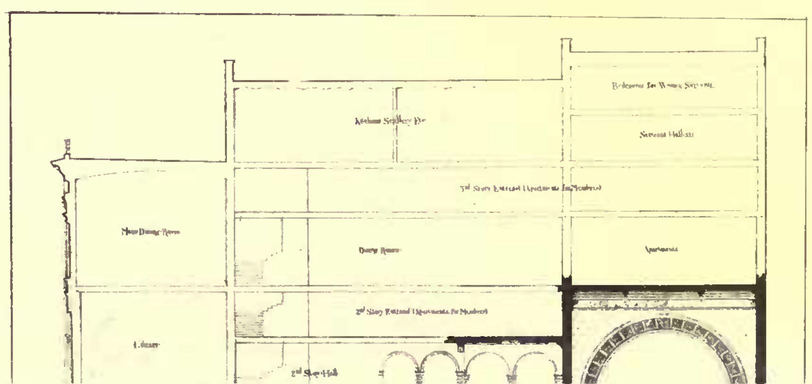
Constantinople, April.

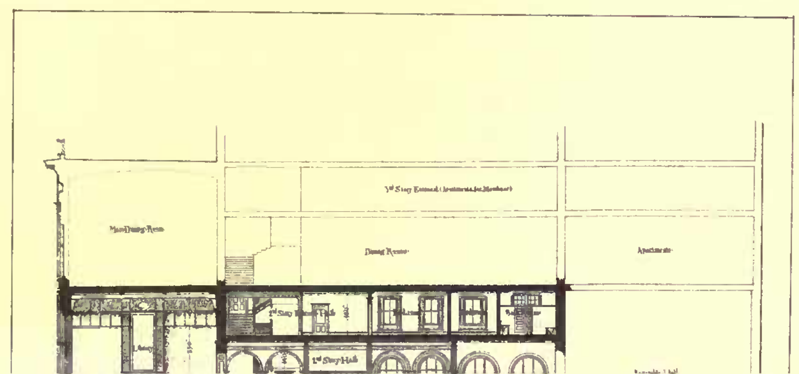
In spite of the natural beauties of an incomparable situation, Constantinople stirred in me a constant feeling of dissatisfaction. I could not escape from the idea that I was looking at it from the rear, and this idea, beginning with my first impression, was curiously carried out by subsequent examination. As we steamed up the Sea of Marmora the first view through the early morning haze justified all expectations. A great and beautiful city seemed to rise out of the calm waters like a cloud castle on the horizon. Nearer yet, and from redoubtable mediæval towers in the foreground stretched sea-walls and

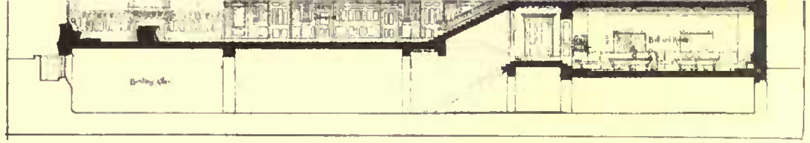
[1] *Town and Country Mansions and Suburban Houses.* With Notes on the Sanitary and Artistic Construction of Houses. Illustrated by thirty Plates, containing Plans, Elevations, Perspectives, and Interior Views of Executed Works in the Queen Anne, Classic, Old English, Adam's Jacobean, Louis XVI., and other Styles. By William Young, Architect, Author of Picturesque Architectural Studies, Spon's Architects' and Builders' Pocket-Book, etc. London and New York: E. & F. N. Spon. 1879.

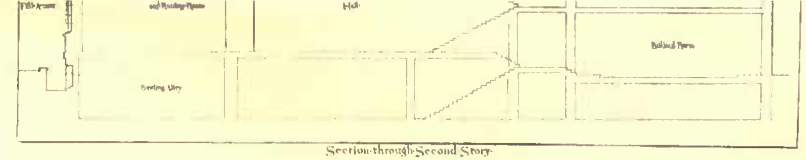

The Heliotype Printing Co. 220 Devonshire St Boston
Design of Residence for Geo. Van Vleck Buffalo
M. E. Beebe Archt.
First Floor
V. Veranda
H. Hall
D. Dr. Room
S. Sitting R.
L. Library
B. Dining R.
K. Kitchen
N. Nursery
Second Floor
H. Hall
C. Chamber
S. Sew'g R.
B. Bed R.
L. Bath R.
O. Office



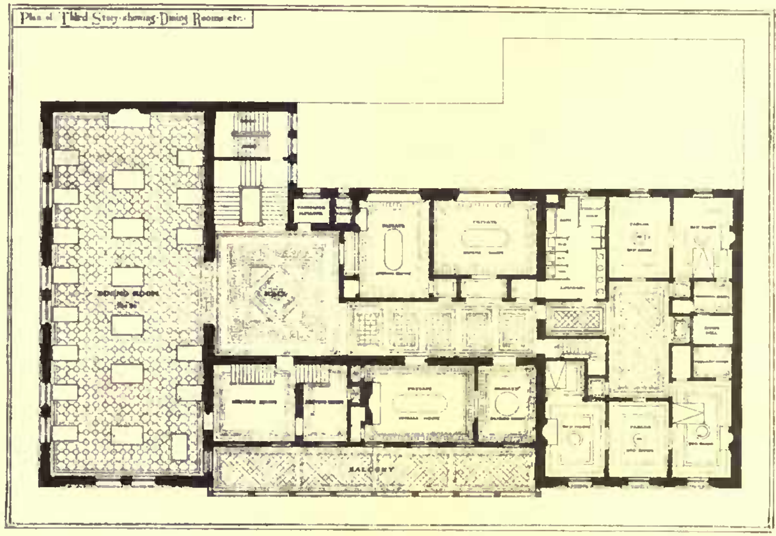




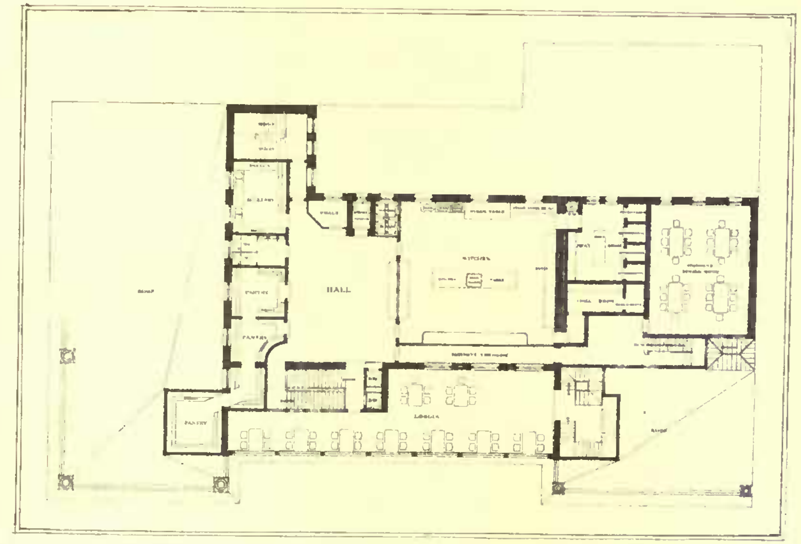


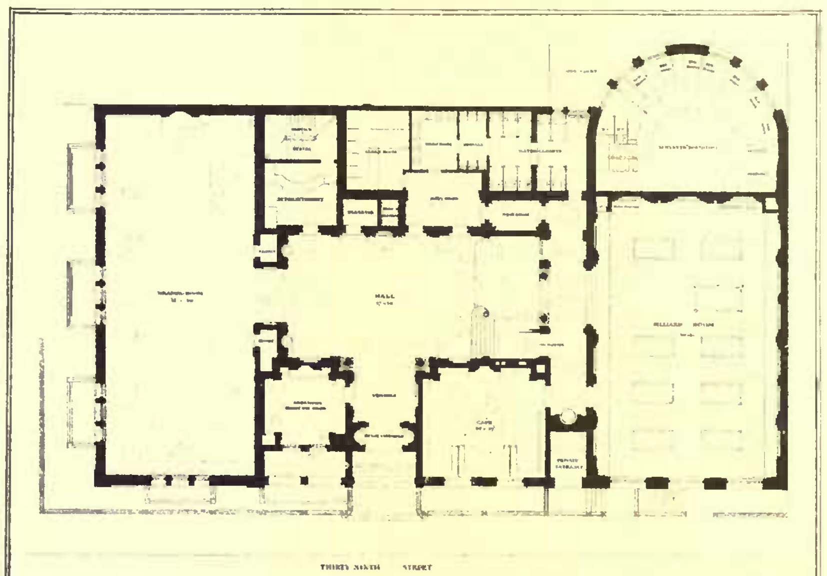


Section through Second Story



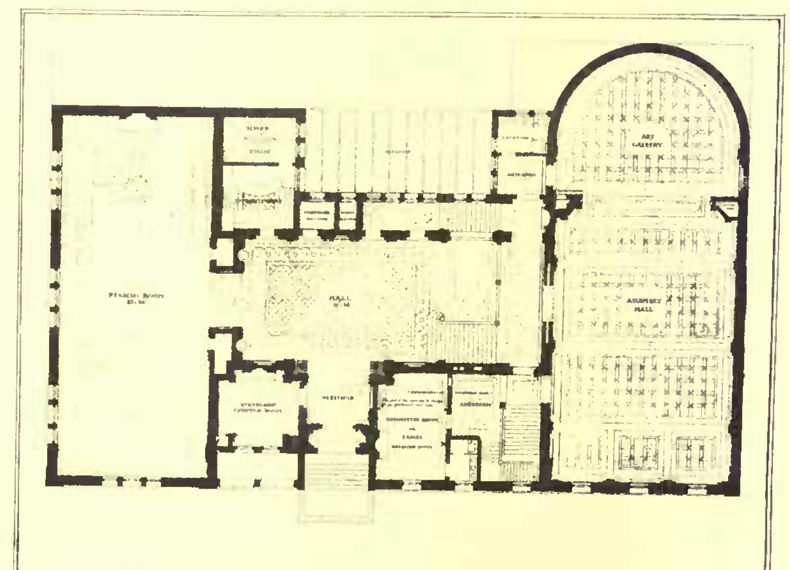
DESIGNS FOR
Union League Club House





First Story

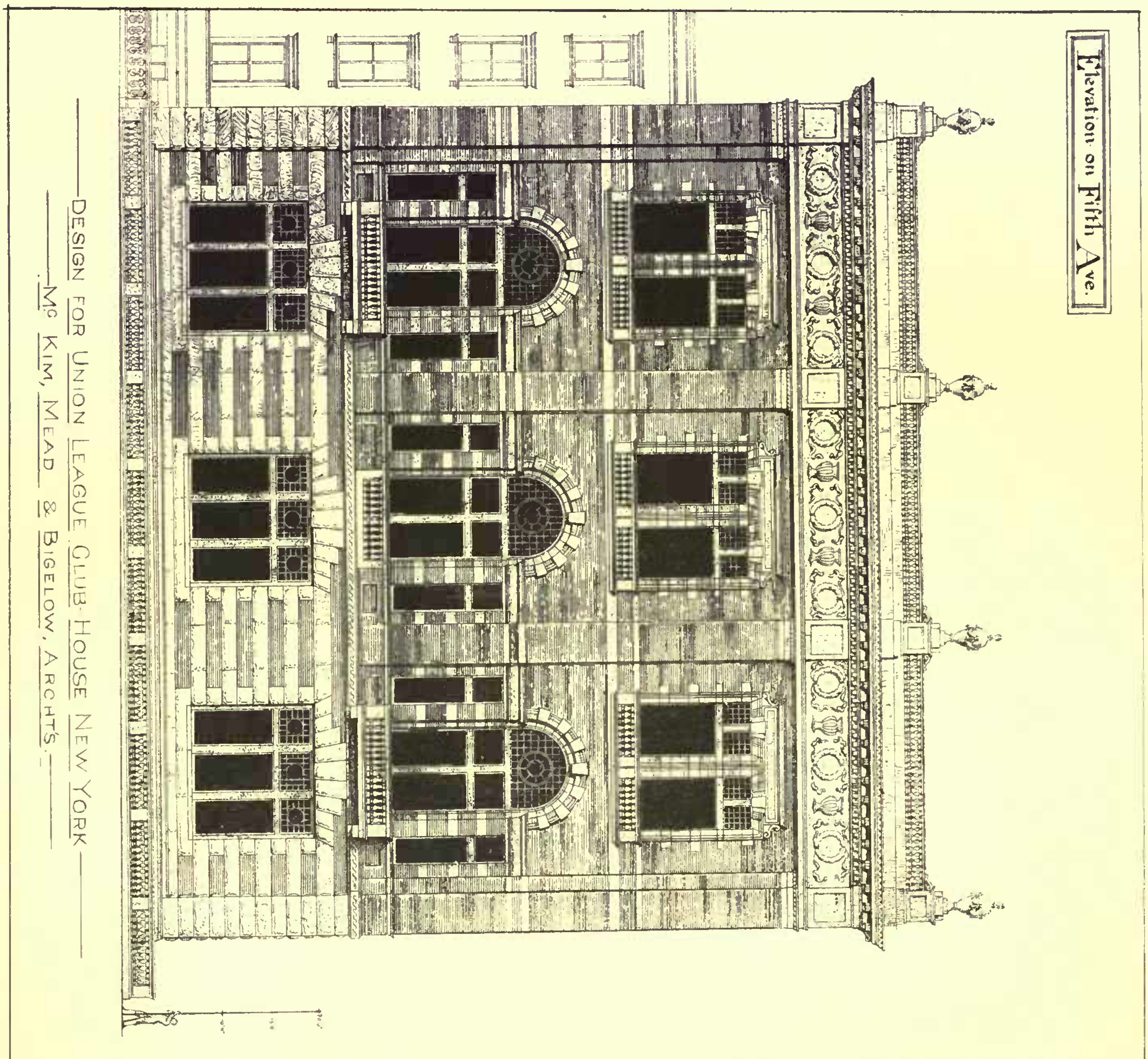
DESIGNS FOR
Union League Club House

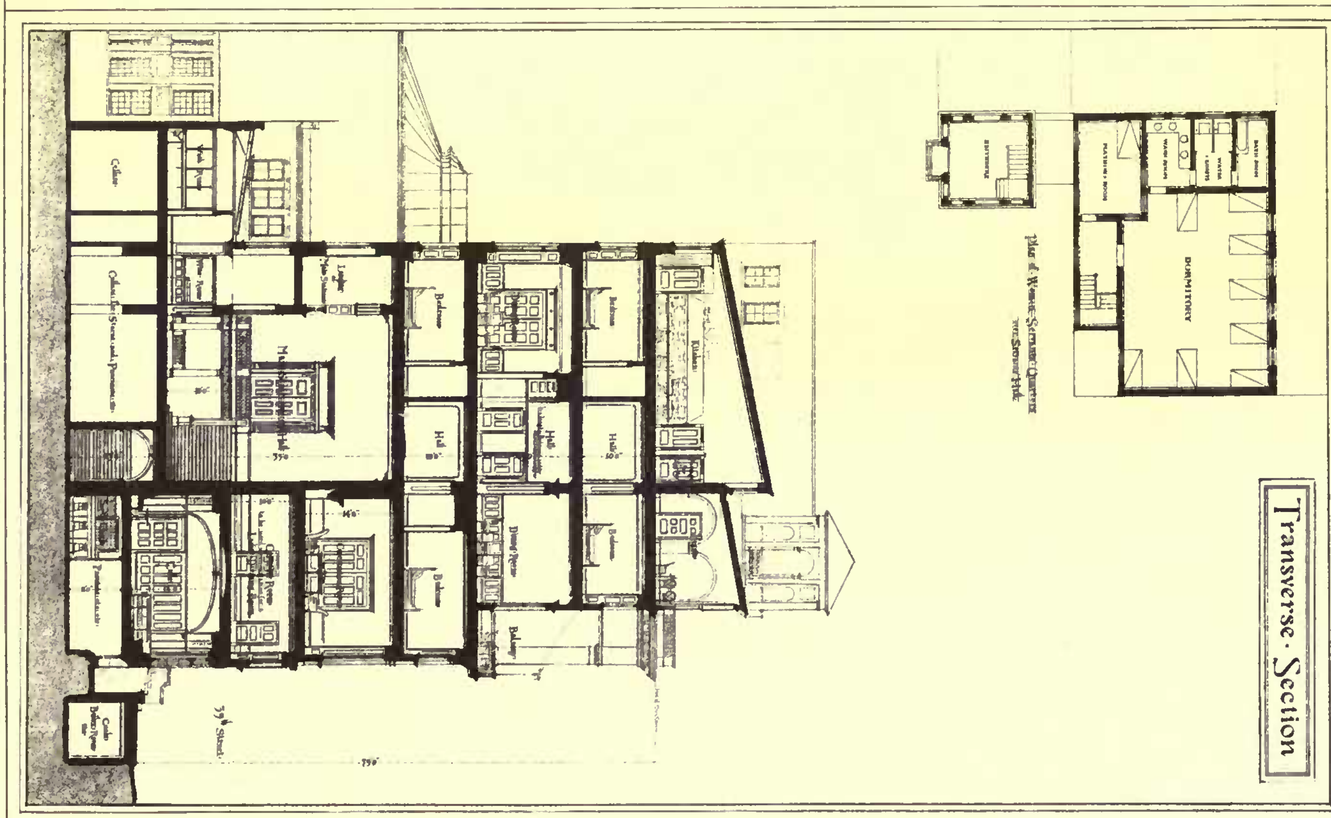


First Story

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON

DESIGN FOR UNION LEAGUE CLUB-HOUSE NEW YORK





THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST BOSTON

houses off to heights with terrace upon terrace of brown roofs; out of these, here and there, rose huge flat-domed piles with slender white minarets. As we drew nearer the city seemed strangely inanimate,—no boats nor people by the water's edge; no sign of life from the houses; no sails were visible before or behind us. This magnificent situation, looking over the broad sea to the Princes' Islands, is really the rear of the peninsula of Stamboul, as we discovered when a few minutes later we rounded the point and dropped anchor in the Golden Horn. Here there certainly was no lack of life in the busy port, crossed by two ever-crowded pontoon bridges. Beyond these the shores curve inland and narrow up to the "Sweet Waters of Europe." On either side of us, directly from the water, rise steep heights crowded with buildings. On the Stamboul side the great mosques loom grandly up against the sky, while opposite from Galata — the European quarter — the huge old Genoese tower stands boldly out. Behind us flows the Bosphorus between river-like banks dotted with villages and palaces. Neither Genoa with her amphitheatre of palaces, nor Naples set in her lovely landscape, can offer such varied elements of beauty. A closer view, however, does not confirm the promise of this effect. Instead of terraces of stately marble buildings as at Genoa, huddled upon the banks of the Golden Horn is a mass of miserable little wooden houses painted in red and brown ochres. A few modern European stone buildings overtop them, but only look bald by the contrast. One feels that he may be in the rear of the city, and that the real fronts face the other way. But once on shore a climb up through the steep half-paved lanes proves that the best has been already shown, and that the reverse of the medal is worse. In vain have the wealthy bankers and the European embassies remonstrated and even offered to take the whole charge of that quarter of the city; there are too many pachas whose purses are replenished from these "jobs" to allow any such innovation; so the narrow, steep lanes continue, except two or three chief ones, quite impassable for carriages and almost so for pedestrians, — ladies often being unable to stir out of doors for a week at a time in rainy weather. Improvements would be the easier since continual fires sweep through this tinder-box city, only, however, to make way for the same little two-story wooden dwellings. As in some far-away cities I know of, the fire department is vigilant, and a fire is instantly signalled from watch-towers to other parts of the city, and help — though not relief — is quickly on the spot, but the fire-god snaps his fingers and works his will.

It is impossible to pass the rickety bridge across the harbor on the way to see Sta. Sophia, without learning the one great lesson of Turkish architecture — the value of a grand and simple outline for great monuments; a consideration to which details of ornament bear the relation of a lichen to the mountain crag. Neither the mighty effort of St. Peter's dome nor the elaborate height of any Gothic spire has so spontaneously impressed me, as the unconscious dignity of these mosques. Rising in pyramidal masses from the heights of Stamboul, the majesty of the central dome, lifted upon a cluster of smaller cupolas, is incomparable; yet that noble composition is the simplest expression of the plan. Except a crescent upon the dome, there is often not an architectural ornament or moulding from cupola to base; nothing but lead-roofed domes and square walls, pierced with a few small window openings, and prolonged at the corners into square lead-capped piers. It is not the absence of any exterior decoration — much less their neglected appearance — which is to be admired, but the courage which, forced by economy or, perhaps, by an æsthetic reason, confidently leaves unornamented the bald construction in the great central features, whose masses and proportions by themselves cannot fail to be impressive. Those parts which on the contrary can make no such claim are enriched and beautified. Thus the minarets, which stand clear of the central mass and generally rise from the corners of the arcaded court preceding the mosque, have their slender height carefully broken by the most richly carved balconies, and the shafts finely channelled or panelled. This court, too, has often a rich cornice, and nearly always very rich stalactite door-ways and, within, a fine arcade. In all general views, however, these last features are hidden by the houses, and only the great central mass rises above them bare and bald, — but always impressive.

The exterior of Sta. Sophia is so extremely bare that it is probable that during the troubled years which succeeded Justinian's reign his successors had neither time nor money to complete and bring it into harmony with the sumptuous magnificence of the interior. It certainly has nothing to commend it but its conspicuous size, and the bold expression of its interior. Its flat dome is still more depressed by the girdle of buttresses at its base between the windows, and as this dome is placed directly upon the square walls, the result is a high-shouldered look. Had the corners of the square been chamfered off in some way I believe the effect of the flat dome would by no means have been bad. The crowning disfigurement, however, lies in the enormous rectangular buttresses, seventy-five feet long by twenty-five wide, which reach almost to the springing of the dome on the north and south side. So enormous are these that at first sight they seem more like buildings than piers. The four minarets are probably the oldest in Constantinople, and certainly the ugliest. Excepting a large tomb chapel near one end, there is nothing in this vast mass of buildings which has the appearance of being finished. It is not surprising, then, that the Turks, in adopting the general features of the church, have built mosques whose exteriors surpass it. The general plan of Sta. Sophia is familiar to all architects. A large but uninteresting Turkish court precedes the original narthex, which is two hundred and five feet long by twenty-six wide; the great nave, or rather hall, with its central and two semi-domes, measures two hundred and fifty by one hundred feet, and is one hundred and eighty feet high; the aisles on either hand add a total width of two hundred and thirty-five feet. It was with a feeling of disappointment at the disordered mass of the exterior that I entered the narthex. Here, indeed, was something worth seeing: the grand vestibule full of rich color gleaming in dim gold from the vault, and reflecting from the rich panels of the marble walls; but I was impatient, and squeezed under the heavy *portière* into the main building. A gasp of surprise — a long breath of swift exhilaration at the brilliant airy space before me. Just below the soaring dome a flood of equal light pervaded the wide atmosphere. No piers nor arches baffled the sight. Freely the eye ranged around and above through the unbroken space. There was an elating sense of freedom and aspiration in this width of pure bright air beneath the lightly poised domes. No preoccupation of constructive difficulties fretted the mind. The means were forgotten in the perfected result. A calm was over all.

Words cannot convey the singular dilation of the senses which I felt, and later remarked in others on their entrance under this wonderful vault. It was a feeling very unlike the sense of littleness with which one creeps insect-like over the floor of St. Peter's, and wonders coldly at its dome as at a giant sepulchre. But here one is spontaneously lifted into a quick sympathy with this grand temple, raised while the Christian religion was yet young in purity and power. Later the same religion built its faith into the intricate beauty of the Gothic cathedral; but in the very beauty of those shadowy aisles, and in the mysteries of its chapels, is there not the taint of darkening superstition? Thus, under the black wing of the Inquisition, Spain built churches into which the light of Heaven hardly penetrates more than into the rayless chambers of Egyptian temples. Then, too, when mediæval superstition was driven out before the revival of learning of the Renaissance, its art, like its philosophies, was pagan. Where then can we look for the pure Christian architecture but in this wonderful church, which Christians have never appreciated, leaving its beauties to be imitated by Mohammedans.

Fine as the first impression is, closer examination only confirms it. Looking from the front entrance towards the apse, on either hand the wall enclosed by the great arch, which supports the dome, is pierced by an arcade of four large marble columns, and above them by six smaller arches. Through these there is a glimpse of the gold mosaics of the aisle vaults; but the eye does not rest there, being carried along to the central niche of the apse, which has two ranges of three windows, and above, in the *conque*, five smaller ones. On each side of this niche others of equal size open with arcades into the side aisles. Just as the windows are carefully designed to give scale to these three niches, so the latter in turn mark the size of the immense half-dome which encloses them, and rises to support the central dome. The opposite end (the front) has a similar disposition. The sides have, beside the two stories of galleries already mentioned, two more stories of windows. Thus, on all sides, from the delicate incised carvings of the capitals and inlaid arabesque on the walls, there is a constant gauge of scale, and a perfect progression from the finest details, gradually but surely up to the great central dome. This is really but little less than a hemisphere, but looks flatter, which gives this uncommon advantage, that, whereas the eye is carried surely up to it as the crowning glory of the structure, the eye as easily descends, and is not, as is generally the case with Renaissance churches, attracted up into the dome and its lantern, and there hopelessly imprisoned, so that it is by an effort that the attention is brought back to the body of the church. The beautiful Byzantine carvings, the marbles and mosaics, which in themselves form a museum, I have not space to describe. The finest mosaics visible are in the splendid galleries over the aisles; the others have been painted over by the Turks, but on gazing up into the apse one becomes aware, with awe, of a mighty form, which, like a shadow, lies upon the vault. It is the great Byzantine mosaic of our Saviour, which asserts itself through the covering with which the Turks have thought to hide it. Here and there also in certain lights dim forms of early saints appear, spirit-like, under the later decoration. Let us hope that these long-suffering martyrs may soon see the light, and that Christendom has at last nearly exhausted its patience, — or indifference, — and will soon reclaim the earliest of its great churches.

Although the Turks set Sta. Sophia before themselves as their type of mosque, they missed some of its essential beauties as completely as did Mahomet those of the Christian faith in his attempt to remodel it. They were not wrong in seeking a greater regularity than the disordered exterior of their prototype, but their attempt to improve the plan by reducing it to a symmetrical figure eliminated all poetry from the design. One of the wonders of Sta. Sophia is the skill with which the grand simplicity of a dome over a square plan is combined with the advantages of a lateral distribution to concentrate the interest at the end of the building. But the efforts of the Turks have been to reduce this plan to a square, with similar motives for each side. Thus their typical mosque plan is a central dome — less depressed than that of Sta. Sophia — resting upon four great piers; half-domes opening from each side are brought down by niches or pendentives upon an outer wall, enclosing the central

square at a distance of half its width, and the small squares thus formed between the piers and the walls are covered with cupolas. Such a plan certainly gives a very monumental exterior, and the first effect on entering this huge vaulted square is impressive, but the eye, finding the same aspect on all sides, is soon wearied. Were the dome richly and variously decorated, this repetition of motive would be satisfactory in giving value to the painting, but the mosque interiors here are without anything which can be called mural ornament — often merely whitewashed. Add to this that the fourteen great mosques have nearly the same dimensions, and it will be understood that they disappoint the interest promised by their impressive exteriors. The mosque which is most worthy to be compared with the great Byzantine example is that which Suleiman the Magnificent built in the middle of the sixteenth century. Although here, too, the plan is nearly square (being two hundred and twenty-five by two hundred and five feet externally), the disposition of Sta. Sophia has been in so far imitated that only the front and rear walls are opened for apses; the great lateral arches enclose a wall pierced with windows and a triple arcade opening into the aisles. Here the chief defect I noticed at Sta. Sophia is remedied, for in the latter the curtain walls under the lateral arches are placed too nearly flush with the inner face of the arch, which within is thus deprived of its aspect of solidity, and gives an awkwardly deep exterior reveal. Though there is nothing beside its noble proportions, two or three fine glass windows, and four ancient monolith columns, this interior is certainly admirable. A curious example of the scriptural exhortation to "lend unto the Lord" may be seen here, for the galleries are piled with boxes of valuables placed there for safe-keeping. The mosque is preceded by a handsome arcaded court which is fast going to ruin, for the Government, though having appropriated the chief endowments of the mosques with a promise of keeping them in repair, really does nothing for them. In the rear is a garden with an octagonal tomb-chapel of the founder. The latter represents a type of structure, called turbehs, found connected with all the large mosques. They are nearly all octagonal, and some of them support their vaults quite independently of the outside wall, upon columns standing some three feet from it. The tomb in question is interesting in showing that if the Turks chose, or were forced by bad building materials, to have no ornaments on the outside of the mosques, they were ready and skilful in lavishing it upon their tombs, which are rich in tiles and inlaid work. The whole exterior and interior of the Suleimanyeh may be taken as the finest example of Turkish architecture, and I believe is not inferior to any building in the world in monumental qualities. Besides these two, there are twenty-four imperial mosques, and about two hundred and twenty built by persons of inferior rank. There are also some three hundred chapels. As I have before said, the plans of these mosques are almost identical, and they have little or no decoration, which is some consolation for the fanaticism which will not allow Christians to enter — much less draw in — many of them. There is an immense difference between the Turks' arrogant hatred of Christians and the distrust with which the Arabs regard us. In Cairo, once armed with a government permission, I found no difficulty in working as I liked in the mosques, but here a permission from the Porte can be obtained to visit only the four principal ones, and that only on paying large bakshish, and one has to be accompanied for safety by a policeman. Several of the largest mosques have, therefore, never been measured.

The Turks have little to show which justifies in our generation their traditions as a race of builders. In abandoning Eastern art for the Renaissance, they succeed about as well as do the Orientals when adopting suddenly Western customs (as Japan is now doing). The Sultan's extravagant new palaces are flimsy and vulgar, and need no mention. There is, however, a small mosque at Ortakeni, lately built, which, besides being a clever adaptation of florid Renaissance to the square domical mosque, has two of the most delicate and slender minarets imaginable. They stand white against the dark hill-side, like flower stems, and it seems almost incredible that they have space for the staircases. This was probably designed by a Frenchman; in fact nearly all the architecture is in the hands of Europeans, — and they have generally no reason to be proud of it. Although the Turks have built perhaps greater monuments than either the Arabs or the Persians, they are far less in purely an artistic sense, and it is to these two nations that all their decoration may be traced. From — perhaps by — the Arabs come the stalactite work in the mosques, while to Persia is due their flower and scroll patterns. The latter are seen to great advantage in the numerous fountains. These, though ungainly in form, offer large surfaces for decoration in tiles and gilding. The detached fountains generally are rectangular, often with rounded corners, and contain a chamber for the distributer of the water, who standing within fills the metal cups and passes them through the railed windows to the people. Immensely projecting eaves and small domes give a picturesque effect, but their beauty lies in the ornaments, which are richly and carefully designed with running patterns of vine and leaf; or in panels are often carved in slight relief vases of flowers. Marble reliefs are often picked out with gold and stone carvings painted; Persian tiles add their beautiful colors also. Even the commonest street taps have some decoration of this kind, which we should find appropriate for our drinking fountains.

Of the many examples of Byzantine churches in this city the greater number are used as mosques, and are inaccessible. The church of the monastery of Chora, built during the reign of the Emperor Alexis Commonus — now the mosque of Kahrieh Jamisi — is of great interest. It has a central dome and two side cupolas, a narthex and an exonarthex. The latter are covered with mosaics, which though late in date are of wonderful workmanship and of exquisite coloring; quite as fine as any of the same date in Italy. It is to be hoped that the whitewash of the central dome conceals equally fine ones.

All the European powers have large embassies; while we have none, but on sailing up the Bosphorus, our flag may be seen waving above a true "American mansard" roof. Ugly as it is, we may well be proud of our countryman to whose generosity is due this fine institution. Robert College, founded in 1863, gives the best instruction to two hundred students, and cannot fail to be a power in this land of ignorant prejudices. R.

SLOW-BURNING CONSTRUCTION.

BROOKLINE, May 26, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — I am under great obligation to your correspondent C. for the kind manner in which he has replied to my last communication, and I greatly regret if I have appeared to do an injustice to the members of a profession among whom I count many of my best friends. We agree in the main in regard to the unsafe character of many of the city structures, but I cannot admit as yet that the "knowledge of the simplicity of the means by which comparative security can be attained" is attained more surely by the professional architect than by the non-professional underwriter. I say this with all respect to C., because the very title with which he heads his rejoinder proves that he has missed the point of my first letter. I have not raised the question "why buildings are not made fire-proof," because I am well aware that the cost would be too great for common uses, and that either the architect, builder, or mill engineer who proposed such a construction for ordinary buildings would fail to get much employment.

Our mills are not fire-proof, but if kept clean and in good order they are *slow-burning*. The contents may burn with great rapidity, but the structures themselves are built with a view to slow combustion.

The underwriters claim that the same quantity of material commonly used in the construction of a city warehouse, school-house, or church, and usually put together in such manner as to make a very combustible structure, can be so combined as to make a very incombustible one, at the same time not more expensive, and in many cases more fit for use, than the ones now built.

The dwelling-house constitutes a more difficult problem because of the numerous partitions, but even here we think a truly skilful architect could get some useful hints from the factory methods.

The city structures to which we take exception are many of them those in which money has not been spared, and where owners, architects, and builders appear to have desired to compass safety; yet in such buildings we find faults which our experience has taught us to be grave causes of danger. It would not be fit for me to designate the exact buildings, lest I should do harm to some individual; but I have now in mind one in which the intention has been to secure complete safety, as nearly as possible, short of an absolutely fire-proof construction, yet its flat roof and the inside finish of its upper story are so combined as to make it dangerous. It could not be insured by the mutual underwriters, even if alongside a factory fire-pump, without a considerable alteration, or a heavy expense for sprinklers in the hollow spaces between its flat roof and its false ceiling; in which concealed and inaccessible space enough wood has been uselessly placed to assure a very great damage and probably complete destruction of its upper stories if fire ever gets there. Rats may set it on fire at any time if oily rags, such as are often used in cleaning furniture or wood-work, should happen to come within their reach. We have several proved cases where rats have caused spontaneous combustion by building their nests of oily waste in such hollow roof-spaces as I have described.

In other buildings, not far from your office, faults of the most serious kind can be pointed out that would have been remedied at even less cost than has been incurred; in other cases, a little of the money spent in excessive exterior decoration, if expended in the interior, would have made the buildings far safer and better for use.

I am well aware of the difficulty which architects often meet when suggesting changes in method, but it is not always so, and I cannot but think that the great attention that has been given to architectural effect and to decorative art has been, in part at least, misapplied, and that it is because of this tendency to develop unduly the fine-art side of the profession that the architect has been so little consulted by those who must of necessity be controlled by the uses to which the building must be put.

During the last ten days the writer has visited one new factory, not yet occupied, for which a professional architect was employed to prepare the plans. It is safely built, but it is greatly injured for use because the arrangement of its windows and the construction of its roof have been subordinated to the architectural effect. It has an unusually good effect, but its owner will pay a heavy annual tax for its enjoyment.

In the same week he has received a report of the last winter's use of a factory building planned by Mr. W. B. B. Whiting, one of the officials of the Mutual Insurance Company, of which he is president.

In reference to the building the report is that, compared to one formerly used for the same purpose, "the saving in gas alone during the winter has paid the interest on the cost of the building." This structure is about one acre in extent, one story high, the roof is so constructed as to be perfectly safe as to fire, and yet the amount of steam coils required for heating is no greater than in a compact building four stories high. It is built of brick with corner towers; the shafting is in the basement; it contains about a thousand gingham looms; its size is about 136 by 330 feet; and it cost a little over $23,000, say fifty cents per square foot of floor surface. The owners are about to build another building, on the same plan, of about the same size, and expect to finish it for less cost than the first one.

Underwriters greatly prefer one-story buildings, and their advantage is now being admitted, not only in respect to safety, but also in convenience and in the higher speed at which machinery can be operated without increasing repairs. In the building above referred to, the looms have been driven at twelve per cent higher speed than they were on the second floor of the old mill, now used for carding and spinning, and the repairs and imperfect work are less.

For the satisfaction of the profession the writer is glad to add that he also lately visited another great factory where the owners are so well convinced of the bad and unprofitable effect of confining the operatives to large, dreary rows of barn-like wooden houses, that they have purchased a large lot of land and are about to employ a professional architect to lay it out and cover it with cottages, the architect having already proved his capacity to produce good effect by simple and inexpensive designs in plain brick.

The question at issue in this discussion is one of grave importance. The annual loss by fires in the United States is $80,000,000 to $100,000,000, and the incidental expenses of sustaining insurance companies and fire departments amount to $50,000,000 more. This fire tax of not less than $130,000,000 a year is the heaviest single tax that is imposed on this nation.

I now beg to submit for criticism by your professional readers a description of a school-house built on the ordinary method, and of a mill built according to our rules. This description had been prepared as a part of a preface to a little text-book we are making for the use of our members. If my description does not apply with tolerable accuracy to the greater part of the school-houses of this vicinity I beg to be corrected.

"If the requirements of a factory and a school-house be compared, the conditions to be met are not very unlike, except that the factory must bear more dead weight. There must be, in both, light, air, ready means of escape, a kind of finish that will bear hard usage, and the least waste of room.

"The brick walls of the factory would be hollow, and would be finished upon the brickwork, with no inside air-space and no furring or lath and plaster; the beams would be in two parts bolted together; the floor would be of two-and-a-half or three-inch plank, with a one-inch top floor; there would be no ceiling on the beams, but the whole construction would be open; the roof would be of the same construction as the floor, with a slight pitch, — this is a very essential point. The towers would be without any well-hole in the stairway, and so constructed that if a cask of water at the top be tapped, the water will flow to the bottom before it can escape. The windows would be cut to the top of each room, to give the maximum of light and air. If division-walls were necessary, they would be either of brick, solid, or of wire lath and plaster, which is now put on in such way as to cut off any passage of fire, even on the studs to which the wire lath is fastened; but we often require partitions even when plastered to be of solid plank. The cellar ceiling around the heating apparatus would be lathed with wire lath and plastered upon the under side of the floor plank and on the outside of each beam, leaving no air or open space behind the plaster, but following the line of the plank and of the beam.

"No decoration is required in the factory, but only the utmost of light, which may be secured in part by using whitewash and not paint; but such a building is capable of very tasteful decoration in solid panel-work between the beams and by the use of color upon the walls. It would meet the rule of true decoration that it would exhibit no sham.

"The school-house, built according to the prevailing method of combustible construction, would have a lower floor of ordinary plank, set twelve or fourteen inches on centres, and braced with wood, unprotected by wire lath and liable to take fire from contact with steam pipe, as lately happened in New York. Above the cellar the sheathing or plaster finish would be furred off from the other wall and from the division-walls even when they are of brick; the hollow space left between the walls and lathing in which fire or vermin may circulate freely would be connected with similar spaces in the partitions between the rooms; these again would be connected with the spaces between the floors and the ceilings, and the whole arrangement, apparently devised for the purpose of carrying a fire from the cellar to the attic, would there be connected with a large space between the roof and the false ceiling hung by wooden connections from the roof plank. In most instances there would be a large collection of chips and shavings between the floors and ceilings, left there during the process of construction. The roof would be covered with boards, subject to be quickly burned through, in place of thick plank, and this draft throughout the concealed spaces where the fire would be completely protected from water would burn most rapidly at the most inaccessible point, namely, the space between the false ceiling of the upper story and the roof. The stairway, if in a tower, would have a large open well-hole; the top of the windows would fail to reach the ceilings by two to three feet. The decoration of this building, if attempted at all, would be stucco or varnished wood, — the one a sham, the other a cause of danger.

"The construction of the factory assures the minimum of loss from the unavoidable fires that occur in the conduct of the business.

"The construction of the school-house renders the occurrence of avoidable fires very probable, and assures the maximum of loss and danger from the minimum of fire. The same false method of construction is the principal cause of the heavy and increasing losses by fire in stone churches, brick and stone warehouses, and other buildings which are exposed to no special hazard whatever.

"There is no common practice without some marked exceptions, and the writer can point to three warehouses, one bank building, and one school-house and several churches in Boston, that are built on the slow-burning or incombustible method; also to one dwelling-house in the vicinity. There are probably many more; but this comprises the number that he has happened to see in the course of his walks about the city, his attention having been given to this subject very many years since, owing to his connection with insurance companies as a director.

"The attention of the owners of property cannot be too quickly given to these subjects, and it behooves architects and builders to study industrial architecture in order to insure a remedy for the terrible burden of the fire tax. It is the conviction of the managers of the mutual insurance companies that such a remedy can be found without involving any extra cost in the construction of buildings intended to be of the better class, such as constitute the new buildings in the burnt district of Boston."

In your own remarks, Mr. Editor, on my first letter, you hesitated to call for designs and specifications for a factory as suggested by me, on the ground that it was asking too much work.

I think you are mistaken; a sketch of an upper story, roof, cornice, and floor, with a sectional plan and a design for a tower drawn with a pen in heliotype ink, such sketches as a good draughtsman could make in a couple of hours, would fully show whether the plan was one that a mill owner could safely adopt or not.

In reply to the proposition made by C. as to the writer's probable course were he called upon to build a hotel, he begs to say that he probably would not attempt an absolutely fire-proof construction, but that he would endeavor to apply the principles of slow combustion, and would also endeavor to build in such a way that the rats in their passage from the cellar to the attic in the concealed flues in the wood-work should not wake him up by stirring the shavings and rubbish over which they travelled, an occurrence which has not been infrequent in some hotels that might be named, and one which probably accounts for the fact that hotels stand at the head of the list in the enumeration of fires. E. A.

[Concerning a call for designs and specifications for a factory, E. A. falls into an error which is common among clients who do not understand the nature of an architect's work. The sketches of upper story, roof, cornice and floor with sectional plan (meaning, of course, section), and design for a tower might be prepared by a good draughtsman, not in a couple of hours, but in a day or two perhaps, provided the architect who offered them had been intrusted by any mill-owners to prepare plans for a mill. These things, however, by no means meet E. A.'s call for sketches and specifications showing all the construction and material of a mill four stories high. But the real cost to an architect is not the mere draughtsman's work in recording his design. This is often a mere drop in the bucket. The cost is in his own time and labor spent in forming his conception and bringing it into definite shape, in directing and overseeing his draughtsmen, and verifying their work. If an architect had once been intrusted by some mill-owner with the planning of a mill, he might have plans ready in such shape that a draughtsman need only make transcripts from them; but this is, in the showing of our correspondent, not to be expected, and in any other case he must spend a considerable time in careful study before he could set his draughtsman at work. We shall be glad to receive any designs for mills with which architects may be willing to favor us; but if E. A. has time to read what we have had occasion to say on competitions in the first part of this paper he may see that our opinions of competitions do not warrant us in lightly appealing to the aid of architects, or in looking for any great response to demands upon them.

We may leave it to C. to discuss the other points in E. A.'s letter, since it is to his remarks that they are chiefly directed, only stopping to say that we do not think that the methods of mill building could be applied to any of the buildings which our correspondent mentions, except the plainest of warehouses, without increasing their cost, unless at the expense of a homeliness that would not be tolerated. There is really nothing so cheap as lath and plaster, to put solid material behind it adds to its cost, and to sheathe plank or timber tightly in it is almost to insure dry rot. Moreover, in dwelling-houses, school-houses, and hotels, the wide spaces behind the framing, in the floors and partitions, and under the roofs, are essential for checking the conduction of heat and noise, unless more expensive means are substituted. These spaces may be so subdivided and interrupted as to make them much less dangerous, but even this costs more than most clients would be willing to consider. A house or hotel built on the mill plan would be almost untenantable. To pass a hot night in a barn chamber, or in a plank-built Swiss hotel on a frequented pass, is a convincing argument. — EDS. AM. ARCHITECT.]

NOTES OF EXPERIENCE AND INEXPERIENCE.

24. WEATHER STRIP. — Can any one tell me how to get a certain device for keeping the weather out under front doors, and consisting of a brass plate, hinged at the ends, which drops down flat into a sinkage in the sill of the door when the door is open, and on closing the door, is raised by a kind of finger on the bottom of the door, into a groove made to receive it. I believe they are made in Connecticut. T. M. C.

23. STAMPED PATTERNS. — I would suggest to "Queen Anne" to draw her pattern on a board one quarter inch thick, and to have it cut out with a jig saw, and then, before the last coat of plaster becomes dry and hard, to lay the pattern against it and scrape the plaster through the cuts with a small chisel. The last coat of plaster should not be more than one quarter inch thick, and the coat under should be set pretty well before applying the last coat; this method I have used successfully — the arrises are sharp.

W.

NOTES AND CLIPPINGS.

Building in Denver, Col. — We have received a letter from the architect who sent us the report of the building outlook in Denver which called forth the response of H., in our issue for May 3, 1879. Our correspondent states that he is not, as H. supposes, a new-comer, but has seen more than half of the city grow up about him, and during this time he has kept a diary which shows that, taking one year with another, in no month is building more active than in the month of March; and that, although last year was a busy one, he has carried on more building in a previous year than any three other architects in the city. He thinks H. may have been misled by the printed reports of the year's work, incorporated in which he himself detected many buildings which were finished the year before, and some two years before.

A Mexican Jacal. — A correspondent of the New York *Evening Post* gives the following description of a class of dwellings common in the neighborhood of Vera Cruz, Mexico: "The dwelling of the Jarocho, variously called *rancho, ranchito,* and *jacal*, generally stands in some small open savanna, close to the timber's edge, though not infrequently it is placed in the thick forest itself. Differing slightly in form in the upper tablelands and the lowlands, the same open-air architecture earmarks the individuality of each. It is essentially a summer house, compared to which the latticed pagodas adorning northern door-yards would oftentimes be warmth itself. In fact, to nothing does it often bear greater resemblance than to a monster bird-cage of peeled willow rods, with the interstices between the reeds rather more limited than usual. Place a steep roof over the miniature osier cages in which foreign birds are imported singly, and an almost exact likeness of many *jacals* will be obtained. The corner posts are generally the smooth trunks of the palm. Crossbeams of the same unite the uprights, and are laid as joists across the top of the framework and as rafters for the roof. The walls are made of a species of bamboo cane — plentiful in the lowlands — cut into proper lengths and set closely together, like the upright rods of the bird-cage. The roof, thatched with the fan-shaped fronds of the palm, laid like slates or shingles to turn the rain, projects far beyond the walls, shading the house from the rays of the tropical sun or beating rain. A cane door, a simple framework of upright rods, and swinging on rawhide hinges, affords ingress and egress. Of windows there is no need, the interstices between the bamboos affording all the light required. To keep out the cold, or, more frequently, the dust raised by a norther, a thin matting of plaited palm leaf, rolled up after the manner of a Venetian blind under the projecting eaves, can be let down all around the house. For this, however, there is scant occasion, a cold day being phenomenal in the tropics, and the matting remains rolled up during most of the year. A queer effect is often seen, especially in a newly-built *jacal*, in the growing of the palm logs after they are placed in the dwelling. Broad leaves spring from their freshly-cut ends, until the whole structure seems, like the house built in the bean-stalk, to be slowly growing into the air. The interior furnishings of the *jacal* exhibit the same unique characteristics as the exterior. Generally the house is of one single apartment; occasionally, in the better class, though rarely, there are two apartments. The floor is of earth, stamped or beaten down to the hardness of a brick; the ceiling, the few palm joists laid across the timbers. Usually there is a raised bench or platform on one side of the room upon which the *petate* is spread for the bed, though the hard earthen floor is often deemed sufficient. About the walls hang some small pictures — colored prints of the Virgin, the sacred heart, or Santa Gaudaloupe, the patron saint of Mexico. It may be that the daughter of the house — and there always is a daughter — has come under the influence of a convent for a time and can read, perhaps write, — a miracle of knowledge. In that event there is a copy of the Lives of the Saints on a bracket, and possibly a prayer-book, much abbreviated by frequent demands upon its leaves for cigarette-paper. If the *jacal* has two apartments, a glance into the inner one discloses the beds used by the female occupants. Perhaps it would be better to say bedsteads, they being mere gratings of bamboo canes, split and laid parallel on a frame with short feet, and covered with a piece of *petate*, or palm matting, which does duty as mattress, pillow, springs and all."

Adhesion of Mortar. — In building the Pont de Claix, some experimental blocks were joined by mortar which was allowed to harden for three years, when the mortar was broken by an average load of 10.0125 kilogrammes per square centimetre [142.228 lbs. per square inch]. This experiment seems to show that the adhesion of mortar to stone is only about one third as great as the cohesion of the mortar itself. The result is noteworthy, as this adhesion is the true measure of the resistance of masonry. Further experiments of a similar kind are desirable, in order to establish formal conclusions. — *Annales des Ponts et Chaussées.*

A New Cement. — A valuable cement is described in *Dingler's Polytechnisches Journal*, which consists of a chromium preparation and isinglass. It is made by dissolving chromic acid in water as follows: Crystallized chromic acid, two and a half grammes; water, fifteen grammes; ammonia, fifteen grammes. To this solution about ten drops of sulphuric acid are added, and finally thirty grammes of sulphate of ammonia and four grammes of fine white paper. The isinglass solution is prepared by dissolving isinglass in dilute acetic acid, — one part acid to seven parts water. These two solutions are kept separate till the cement is needed. When used for envelopes, for which the cement seems specially adapted, the chromium preparation is applied to the part under the flap, while the flap itself is moistened with the isinglass solution. The two are then pressed together, and a cement is formed, which is firm and solid, insoluble in hot or cold water, or even steam, and not affected by either acids or alkalies.

A Wood and Asphalt Floor. — A new method of laying a basement or cellar floor has been adopted lately in certain fortifications at Metz, where it is said to give satisfaction. Pieces of oak, three or four inches broad, one inch thick, and one or two feet long, are pressed down into a layer of hot asphalt, about half an inch thick. When the asphalt has hardened, the wood, which, in order to furnish a key to the asphalt, is bevelled on each side, can be planed to a true surface. The wood is usually laid in herring-bone pattern.

Weather-Worn Glass. — Experiments lately made in London on the loss of light caused by imperfect glass in the street lanterns show that the glass usually used causes a loss of nearly fifteen per cent of the illuminating power, while certain samples of the same kind of glass which had been long in use, and whose outer surfaces had consequently been etched, as it were, by exposure to the dust-laden winds of the city streets, showed that as much as 83.81 per cent of illuminating power was lost.

A Curious Accident at Paris. — Towards the end of his reign Napoleon III., being hard pressed for money, confiscated for his own uses the portions of the Luxembourg Gardens at Paris lying on either side of what is now known as the Avenue du Luxembourg, intending to sell the land thus seized for building-lots. His plan miscarried because the authorities declared that the catacombs underlying that section of the city would not support the buildings it was proposed to place over them. An accident which has lately happened in the Passage Gourdon, not far from these gardens, shows how necessary was this prohibition, and shows, too, what traps for the unobserving houses in this quarter may prove to be. A sculptor, M. Marcellin, noticed one day that a horizontal crack, one millimetre wide, had declared itself in a certain bond-stone at the door of his atelier. Being a man of intelligence, as well as observing, he pasted a strip of paper over the crack and waited developments. In the course of a week the paper cracked longitudinally, so that he could no longer doubt that the settling was still going on. He at once called in an architect, M. Huguelin, who lived near at hand, and an inspection of the premises was made at once. So little was any immediate danger suspected that the families of both gentlemen descended into the cellar of M. Marcellin's house, which, by the way, was the middle house of a block of three. M. Huguelin at once detected some dangerous-looking cracks in the cellar vaulting, and as he watched he noticed the stone newel of the stairs sinking before his eyes, while the stone steps were momently becoming more disjointed. Hardly had the frightened watchers reached the door-yard, when a decided settlement took place, the window-glass splintered in every direction, and the whole atelier fell through to the cellar. The upper stories of the house were still supported on the iron floor-beams which were let into the party-walls of its two neighbors, and added the strain of the partly unsupported weight of the upper stories of the wrecked building to the dangers of their uncertain foundation. Temporary shores and props were applied, and then strong scaffolds were built in front of and behind the building, and a long beam was run, with the nicest care, through the building from side to side, for fortunately two windows reaching to the ceiling of the second story chanced to be exactly opposite each other. All work had to be done from the outside, as it was not thought safe that any workmen should enter the building.

The French and English Obelisks. — More than two hundred men and very complicated machinery were required to erect the obelisk of Luxor in the Place de la Concorde at Paris, and this at a cost, including transport, of $300,000. Only twenty-five men and very simple apparatus were used in erecting Cleopatra's Needle upon the Thames embankment. The expenses for the same operations upon Cleopatra's Needle reached only about one fourth of that amount. The following figures give a comparison between the two obelisks: —

	Cleopatra's Needle.	Obelisk of Luxor.
Height,	68.5 ft.	74 9 ft.
Volume,	2528 98 c. ft.	2915.62 c. ft.
Weight,	186 tons.	225.9 tons.

The Strength of Ailantus Timber. — Professor C. S. Sargent says that in experiments made in the dockyard at Toulon, France, where the wood of the ailantus has been tested as to its resistance to strain and compression in comparison with the wood of the European oak and elm, the average of seven trials showed that the ailantus timber broke under a weight of 72,186 pounds, while elm timber yielded to 54,707 pounds, and that oak timber would endure but 43,434 pounds. It is not yet shown satisfactorily how the ailantus will resist exposure to water and atmospheric influences, but the indications seem very encouraging. For interior work and for cabinet-making the wood is peculiarly adapted, as it works freely, seasons readily, and is the equal of mahogany in its freedom from warping and shrinking. For floors and stair-treads its lasting qualities are unsurpassed.

Kaolin. — A valuable bed of kaolin has been discovered two miles from Bloomsbury, N. J. The earth is of the finest quality, and the deposit is large.

Bell Metal. — A superior bell, according to Kirke, requires the proportion of 144 pounds copper, 53 pounds tin, and three pounds iron. Iron, copper, and tin do not unite well, if each is added separately to the other; but if tin-plate scraps are melted in a crucible together with tin, and then this tin and iron alloy added to the molten copper, it will unite readily. Another alloy that is highly recommended is composed of 53.5 parts copper, 6.11 parts tin, 2.13 parts lead, and 3.9 parts zinc, this alloy having a good, sonorous sound, even if the mould is not thoroughly dry. The silver bells of Rouen, France, consist of 40 pounds of copper, 5 of tin, 3 of zinc, and 2 of lead.

A Clerical Jack-of-All-Trades. — An English vicar at Carlton-in-Cleveland, Rev. George Sanger, has sent to the members of his parish the following circular, which has been called forth apparently by complaints of his action in restoring a parish church: "I feel sorry for the necessity of a letter to vindicate my conduct in rebuilding the parish church, which became so dangerous after last August gales that service could no longer safely be conducted under its roof. If I had not taken upon myself the rebuilding, the burden would have fallen upon the parish. You must all be aware that I have worked as few clergymen ever yet worked to rebuild church. I worked as a bookbinder, for two years, to get money; obtained the subscriptions, writing upwards of two thousand letters; designed the building, acted as clerk of works and contractor; carved all the wood and stone, and worked with the men employed; and I ought to be allowed to complete the work in peace and not be publicly insulted for the benefit I have conferred upon the parish in building a church which for elegance is second to none in its locality."

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The frightful accident in Cincinnati a few days ago, when Post & Co.'s building fell and crushed the men who were working in it, is of a kind to leave a discouraging impression, because the venturesomeness or recklessness which made it fatal is of a kind that may be expected anywhere and at any time, if it is permitted, while to check it is difficult. The building had taken fire in the night, and the fire had swept through it from top to bottom, but had been put out before it had destroyed the floors or even the roof, although the floor timbers were partially burned, and the roof so riddled that it was necessary to cover it with a tarpaulin. There was a good deal of machinery and heavy stock in the building, particularly on the upper floors, and the owners, after having it inspected by the insurance adjusters and by a builder, put a gang of forty men into it to remove the rubbish. They had contracts to fulfil, and seeing that the building held together they proposed to start their machinery and resume work the next day, meaning, apparently, to carry on repairs while under way. But in the middle of the afternoon part of the roof suddenly gave way and fell upon the fifth floor, breaking it through. Each floor in turn carried down the one below, till a section of the building had fallen through from roof to cellar, killing half a dozen men, and wounding more than twice as many others. There is a "question of veracity" between the owners and the builder who was called in, — the owners saying that before they put their men in they had the assurance of the builder that the structure was safe; the builder declaring that he was called in merely to consult upon repairs, and only incidentally asked whether he thought the walls were safe. An insurance adjuster who examined the building after the fire is recorded as saying that, being familiar with burned buildings, and a cautious man, he "knew that there was no carelessness or recklessness of any kind in having men work in the building." He adds that the floors were not badly burned, although the joists in three of them would have to be replaced, as was the decision of the builder.

The questions of veracity and of responsibility may be left to those whose business it is to determine them, and if we may judge by the decided action of the coroner next day, in stopping the work of exhumation, which was still going on, they are likely to be brought home. We may safely assume, however, that the builder who went through the half-burned warehouse with the owners, and examined it with the idea of restoring it, understanding that men were to be set at work to clear it out, and who did not suggest any doubt of its safety, expected it to stand. It is plain, then, that neither the insurance adjuster, nor the owners, nor the builder, had any misgiving concerning the safety of the building, of which, it was agreed by all three, the roof and three floors were so burned as to make it necessary to replace them, and in which these floors were loaded with machinery and heavy goods, among which a gang of workmen were to be set tramping about. The truth was, obviously, that none of the three was capable of judging whether the building was safe or not, and none of the three nor all the three ought to have taken the responsibility of deciding that it was safe. This we say not to discredit the persons concerned, but simply because the case was one which called for the judgment of a different person, — the judgment of an engineer, or of some one with an engineer's knowledge. We may not say that an engineer would have condemned the building, but we do say that the only safe person to consult was an engineer, or an architect with the training of an engineer. The question how far partially burned wood can be trusted is a difficult one, and only to be answered by inference and conjecture; but we should have the inference and conjecture of a man who has studied the theory of the behavior of materials under strain. And it is a noteworthy thing that men of theoretical knowledge are more inclined to the safe side than men whose only knowledge is practical. To the ordinary observer it appears that anything which has stood may be expected to stand; but the engineer knows that this does not follow. Structures do stand which are insecure by all the rules of construction, but such structures are always likely to fall. The only reasonable course is to do away with all structures which ought to fall, and to ask the right people whether they ought to fall. The people of Cincinnati begin naturally to call for competent authorized inspectors who shall decide by something better than a happy-go-lucky guess, when there is a question of running such awful risks as in the Post building. When it is commonly realized that it is not safe for an owner, or a builder, or an insurance adjuster, or anybody else unprovided with special knowledge of construction, to determine difficult questions of safety in building, we shall have made one step toward security.

The predominating interest of the Chicago Custom-House has made us neglectful of the fortunes of its neighbor, the City Hall in the same city, whose troubles, so often commemorated in these columns, are not yet at an end. It is four or five weeks now since the Stone-Cutters' Union of Chicago, whether moved by dissatisfaction at the policy of the contractors toward their workmen or by more patriotic motives, gathered to themselves a number of other persons who were displeased at the progress of the work on this building, and, having called a public or semi-public meeting, appointed what may be called an amateur investigating commission. This commission, after examining the stone-work on the building, pronounced it to be of bad material, badly patched and badly set, whereupon a memorial was addressed to the City Government recommending an official investigation of Messrs. Tomlinson and Reed, the contractors. A special official committee was in consequence appointed by the City Council, and they reported not long ago that much of both the stone-work and the brickwork of the building was bad, and would have to be taken down. They asked permission to call into counsel architects, masons, and stone-cutters, for a thorough examination, and recommended that work and payment should be stopped on the building till the examination was finished. In consequence of this an expert committee of three architects and two builders was added to the committee of the City Government, and their report was to be submitted this week.

The managers of the Philadelphia International Exhibition do not lack enterprise, and their projects, as set forth in their last official bulletin, will provide a field for all they have. Their original aim was neither narrow nor single, being to furnish an "attractive place of entertainment and instruction to the people of the State and nation;" and having, as they say, succeeded for two years in this, they now propose to expand and classify their collections so that they may offer a systematized exhibition of all the products of human activity, and add to their original provision of "a bazaar for the exhibition and sale of goods, and a place of refined amusement," an efficient engine for popular education. To this end they have reorganized their Council of Education and have distributed under its patronage the whole range of objects for exhibition and instruction among ten departments, each in charge of its own chief and his subordinates. The enumeration of the scope and methods of organization under each department is the principal material of the bulletin. These departments are: the Department of Inorganic Material, including the sections of geology, chemistry, and mining engineering; the Department of Organic Material, covering botany, zoölogy, anatomy, physiology, and palæontology; of Archæology and Ethnology; of National Architecture, Furniture, and Costume; of Model Homes; of Agriculture; of Machinery and Manufactures; of Industrial Training; of Schools, including all educational appliances; and of Fine Arts. The usefulness of the collection in each department is to be furthered by means of instruction or encouragement, — by libraries of books and laboratories, by courses of lectures appropriate to

each department, by loan and sale exhibitions, or competitive trials, and by permanent schools. It will be seen then that the undertaking, originally modelled on the Museum at South Kensington, has in intention far outrun its prototype, and proposes to combine in one tremendous whole the Kensington Museum, the Sydenham Crystal Palace, a technological school, and a permanent fair.

IT will be seen that here is an institution which is not to be built up in a day, even assuming that its realization, and the safe administration of it when realized, are possible. But we need hardly say that we think that such different objects as are here aimed at are attempted better separately. When entertainment and instruction are combined in one plan the instruction is pretty sure to go to the wall. South Kensington itself has by no means avoided the reproach that the spirit of the bazaar has infected that of the school; and the Crystal Palace, heralded as a great educational apparatus, has from the beginning been given over to popular diversion, — and to bankruptcy. It is only for subjects of a tender age, and with a very modest scope, that the blending of amusement with instruction has been made to succeed, even with the fullest appliances for object-teaching. One naturally looks with some anxiety, therefore, on an attempt to establish — shall we say it? — a national kindergarten on so grand and costly a scale. When it comes to commingling the commercial element with the other two, the difficulties increase. The commercial element is very ambitious of dominion, and very despotic when once enthroned. It is not clear how much influence the International Exhibition Company intend to allow to the spirit of commerce, but it is clear from what we have quoted that they appeal to it, and when this spirit gets foothold, its associated interests are apt to fare hard. Of the financial and other practical difficulties of their undertaking, its projectors may be assumed to be better judges than we. To establish such collections as they propose except by voluntary contribution of articles intended for sale is of course impracticable; but such contribution is not favorable to control or system, so that to bring the collections to the completeness and order necessary for systematic work is a formidable task. If this were possible the space in the great exhibition building, large as it is, — it is not much larger than the Crystal Palace, — would be altogether insufficient for such a display, and a very great amount of new space would have to be provided. But that is looking a long way ahead. The undertaking must develop slowly, and if it leads to any success, which we may heartily hope it will, it is likely to develop into some other shape and a less comprehensive one than its projectors now intend. We may trust that whatever shape it comes into, it will fairly acknowledge itself and its limitations: that if it turns out a fair, which is a useful thing, it may be made as good a fair as possible, not shaming itself by trying to wear the air of a place of instruction; or if it grows into a genuine museum and school, that it may not be clogged by the accretions, or vitiated by the spirit, of a bazaar.

THERE is no need to undertake criticism of a system of classification which is merely tentative, and in which experience may be expected to dictate many changes. But the detailed schemes that are offered by the chiefs of some of the departments, which would especially interest an architect, suggest a word of comment. The Department of Architecture, for instance, is to be arranged on the model, not of any architectural museum or place for architectural study, but of the courts at the Crystal Palace. Thus it is proposed to have an Egyptian court, a Greek, a Roman, a Byzantine, a Latin court (whatever this last may be); courts Arabian, Moorish, Indian, Persian, and Chinese; Romanesque, German Gothic, French Gothic, English Gothic, Italian Renaissance, French Renaissance, and Elizabethan. To these would be added a series of structures representing the architecture of modern nations, and extended so as to include the rudimentary architecture of the savage and the nomad, down to the hut, the tent, and the wigwam. We need not expect that such a scheme will ever be fully carried out, but the idea is quite obviously unsuited to anything but a mere public show. There is a certain picturesque attractiveness in the Egyptian, Assyrian, and Alhambra courts at the Crystal Palace, puny as they are, but they are after all only suited to a fair, and when it came to multiplying them so as to include the whole range of architecture, the replication of pygmies would be intolerable.

FOR any purpose of real instruction a few full-sized fragments, such as the order of the Parthenon set up in the museum of the École des Beaux-Arts, at Paris, or the pediment of the temple of Ægina in the Glyptothek at Munich, with a capital or two from elsewhere, would be worth them all. The character of architecture is best shown, either to the student or to the intelligent observer, by full-sized casts of detail, and in the *ensemble* by drawings, prints, and photographs, or now and then by a well chosen model to small scale, things which admit of compact arrangement and easy consultation. But the proposed series of model buildings, taking in all architecture, ancient and modern, and filled with their appropriate furniture and costumes, would be simply a collection of baby houses, which, if it were consistently carried out, would fill the great exhibition building from end to end. Besides the Department of Architecture we have the Department of Model Homes, which is to include examples of every kind of household apartment with model appliances for its decoration and furnishing, and for all the uses of housekeeping. This implies a sample exhibition of a world of objects which can never really be included in one conspectus, — which are constantly changing and whose variety is endless, — things in fact which surround us all, which we are always studying in the shops, in our own houses, and those of our neighbors, to better advantage than we ever could at an exhibition. In truth we seem to trace the kindergarten idea pervading the details of this grand scheme, in curious contrast to the greatness of its avowed intention. This might make the exhibition effective as one of the sights of Philadelphia, intended for the amusement of children of a larger growth, but it really would not need such complexity of organization or such complete and far-reaching elaboration of detail.

AMERICANS need not feel any special gratitude to foreign savants, or even to native ones, who find scope for their ingenuity in suggesting to us cheap uses to which we may put Niagara Falls. We mentioned at the time they were first broached (*American Architect*, May 5, 1877) Dr. Siemens's computation of the water-power of our great cataract and his suggestions for its utilization. It was a relief when we found that Mr. Edison, who had been invited to try his hand at grinding electricity out of the fall, had concluded that the experiment would cost more than it would come to. But the question is one of those that are not allowed to sleep long, and a paragraph has lately been going the rounds of the papers which smacks suspiciously of Dr. Siemens's figures, computing again that the annual water-power which "runs to waste" in the great fall is seventeen million horse-power, or the equivalent of the earth's annual production of coal. And lately Sir William Thompson, in giving evidence before a Select Committee concerning the serviceability of the electric light, took occasion to prophesy that the Falls of Niagara would in due time be used to supply light and mechanical power over a large area of the United States. Let us hope, nevertheless, that the people of the United States will grow in appreciation of the few natural features of unrivalled magnificence which nature has given them as fast as they grow in mechanical skill, and will prefer to listen to a countryman of Sir William Thompson, the late Governor-General of the English Provinces, Lord Dufferin, who proposed that our Government should join with his to set apart Niagara and the region about it as an international park, secured forever from injury and degradation. It is perhaps not unnatural that Europeans should forget that we are likely to have other water-power which could for generations spare us the occasion for reverting to the most magnificent of all; but there seems to be a fatal itching among great projectors to pit themselves against the mighty works of nature, somewhat as the tourist thinks that mountains were made for him to climb, or as the small boy burns to kick at an elephant. There are a thousand unused water-falls distributed over the land ready to apply their power when it may be needed: there is but one Niagara, and the world would not easily forgive us for marring it. Possibly some future Sir William Thompson will discover that this one is useful to the economies of nature in its present working, as it has been found that there is a use for the forests that cover leagues of land to us unproductive, or for the mountains which the thrifty farmer would fain cast into the sea. In the mean time no man — be he inventive man of science, or scheming man of business — is justified in telling us that Niagara runs to waste because it has not been set to turn his mill.

THE OPEN FIRE-PLACE. XIII.

THE above Tables III. and IV., although records of single experiments, are representatives of a large number made to verify each other. The tests were made with such care that the results were closely similar where the amounts of fuel burned were the same, and its hygrometric condition the same, *i. e.*, containing about ten per cent of water.

Where larger quantities of fuel were burned, the saving of heat would vary in proportion, on account of the varying absorption of heat in the walls of the heaters and in the brickwork. There should also be a slight variation, for the same reason, between the calorific power of the heaters themselves, corresponding to variations in the amounts of fuel consumed, because of the different methods of setting, and of the presence or absence of a fire-back inside the iron case of the stove.

In order to ascertain these differences, as well as to test more fully the accuracy of the results previously obtained, careful experiments were made on two successive evenings, on the Dimmick Heater, and on the Fire on the Hearth Heater. These two heaters may be taken as types of the various kinds of ventilating fire-places heretofore described, and their calorific power once accurately obtained, we have a gauge for the rest.

These may be divided into two classes, the first having hot-air circulation tubes, and the second having a radiating drum above the fire and a smooth or ribbed shell for its fire-box. The Dimmick Heater represents the first, and the Fire on the Hearth Heater the second class. The experiments were made under similar conditions with those previously made, but burning in each case eight kilograms of wood, instead of three. Most of the experiments herein described having been made after office hours, the liability to interruption was avoided and greater accuracy assured.

Great care was taken to protect the thermometers by plates of glazed tile from the direct radiation of surrounding objects likely to affect them. The experiment recorded in Table V. was made on the Fire on the Hearth Heater; that in Table VI. on the Dimmick Heater. In the former the size of the left-hand register was slightly enlarged beyond what it had been in the previous experiments, measuring in this 150 square centimeters in area and in the previous only 140 square centimeters. Both heaters were set in the most careful manner, so as to insure the best contact of the fresh air against their heating surfaces, and the observations were taken nearly every minute, although only one in every five minutes is recorded in the accompanying tables, on account of want of space. The calculations were made on the figures for each minute, and the sums of the results obtained for intermediate minutes not here recorded are placed in the tables opposite those given.

By Table V. we find the heat saved by the Fire on the Hearth Heater in burning eight kilograms of wood was sufficient to raise the temperature of 6797 cubic meters of air 1° C. This is equivalent to 2121 heat units. Assuming that our eight kilograms of wood, containing about ten per cent of water, yielded $8 \times 3590 = 28{,}720$ units, the amount saved was again seven per cent, as in the previous experiments of which Table III. records one. Add six per cent for radiation, and we have again thirteen per cent utilized where wood is burned, and $7 + 13$, or twenty per cent, where coal is the fuel, and with the upright double flue attachment twenty-five per cent or thirty per cent as before. We see by this table, columns 1 and 10, that, while it took but a little over an hour to burn up the eight kilograms of wood, the heat remained in the fire-back and brickwork for over two hours and a half after the wood was burnt out, and that, indeed, more heat was given out after the fire had gone out than while it was burning.

TABLE V.

Time: Evening of May 23, 1879.	Temperature of Air entering through Left-Hand Register.	Temperature of Air entering through Right-Hand Register.	Velocity of Current entering through Left-Hand Register, in Meters, per Minute.	Velocity of Current entering through Right-Hand Register, in Meters, per Minute.	Cubic Meters of Air entering through Left-Hand Register.	Cubic Meters of Air entering through Right-Hand Register.	Equivalent in Cubic Meters raised 1° (Left-Hand Register.)	Equivalent in Cubic Meters raised 1° (Right-Hand Register).	Remarks.
1	2	3	4	5	6	7	8	9	10
9.20	12°	12°	36	76	.54	.98	1.08	1.98	Fire lighted.
.25	17	13	63	76	.95	.98	6.65	2.97	
.30	22	14	76	57	1.15	.74	13.80	2.96	2d kilo. put on.
.35	28	17	90	57	1.35	.74	24.30	5.18	
.40	34	20	69	57	1.04	.74	24.96	7 4	3d kilo. put on.
.45	40	23	66	66	1.00	.86	30.00	11.2	4th kilo. put on.
.50	49	25	54	66	.81	.86	31.59	12.9	
.55	49	27	72	66	1.08	.86	33.54	14.6	5th kilo. put on.
10.	50	30	90	66	1.35	.86	54.00	17.2	
.05	55	30	90	66	1.35	.86	60.75	17.2	6th kilo. put on.
.10	57	30	90	66	1.35	.86	63.45	17.2	7th kilo. put on.
.15	59	30	36	54	.54	.70	26.46	14.0	
.20	60	30	54	54	.81	.70	40.50	14.	8th kilo. put on.
.25	61	31	66	54	1.00	.70	51.00	14.7	
.30	61	31	79	54	1.19	.70	60.70	14 7	
.35	60	30	97	54	1.46	.70	73.00	14.7	
.40	56	29	66	45	1.00	.58	46.00	11.0	
.45	52	27	66	54	1.00	.70	42.00	11.9	
.50	47	26	66	66	1.00	.86	37.00	10.2	
.55	45	24	66	48	1.00	.62	35.00	8.7	
11.	40	20	66	48	1.00	.62	30.00	6.2	
.05	39	19	66	54	1.00	.70	29.00	6.3	
.10	38	18	66	57	1.00	.74	28.00	5.9	
.15	36	18	63	54	.95	.70	24.70	5.6	
.20	35	17	57	54	.86	.70	21.50	4.9	
.25	33	17	54	54	.81	.70	18.63	4.9	
.30	32	17	51	54	.76	.70	16.72	4.9	
.35	30	16	48	54	.72	.70	15.84	4.2	
.40	29	16	45	54	.67	.70	13.40	4.2	
.45	28	16	39	54	.58	.7	10.44	4.2	
.50	27	16	31	54	.47	.7	8.00	4.2	
.55	26	16	31	54	.47	.7	7.52	4 2	
12.	25	16	31	54	.47	.7	7.05	4.2	
.05	24	16	31	54	.47	.7	6.58	4.2	
.10	23	15	31	54	.47	.7	6.11	3.5	
.15	22	15	31	54	.47	.7	5.64	3.5	
.20	21	15	31	54	.47	.7	5.17	3.5	
.25	20	15	31	54	.47	.7	4.70	3.5	
.30	19	14	31	54	.47	.7	4.23	2.8	
.35	18	14	31	54	.47	.7	3.76	2.8	
.40	17	14	31	54	.47	.7	3.29	2.8	
.45	16	14	31	54	.47	.7	2.82	2.8	
.50	15	14	31	54	.47	.7	2.35	2.8	
.55	14	13	31	54	.47	.7	1.88	2.1	
1.	13	13	31	54	.47	.7	1.41	2.1	
							1034.52 5	325.0 5	
							5172.60	1625.0 5172.6	
							Total,	6797.6	

TABLE VI.

Time: Evening of May 22, 1879.	Temperature of the Fresh Air entering Room through Register.	Velocity of Air in Meters per Minute.	Volume of Fresh Air in Cubic Meters per Minute.	Difference between external Air and Air entering Room through Register.	Equivalent in Cubic Meters raised 1°.	Remarks.
1	2	3	4	5	6	7
9.05	16°	18	.072	3°		Fire lighted.
.10	20	25	.10	7	2.12	
.15	30	30	.12	17	6.5	Second kilogram put on.
.20	64	38	.15	51	25.3	
.25	78	45	.18	65	51.4	Third kilogram put on.
.30	107	54	.22	94	82.1	
.35	116	54	.22	103	109.3	Fourth kilogram put on.
.40	128	54	.22	115	119.4	
.45	137	55	.22	124	134.2	Fifth kilogram put on.
.50	145	55	.22	132	142.0	
.55	148	55	.22	137	147.7	Sixth kilogram put on.
10.	156	55	.22	143	154.9	
.05	156	54	.22	143	157.2	Seventh kilogram put on.
.10	164	55	.22	151	163.0	Eighth kilogram put on.
.15	166	55	.22	153	166.0	
.20	168	55	.22	155	169.5	
.25	163	55	.22	150	169.6	
.30	158	57	.22	145	165.0	
.35	140	48	.19	127	159.6	
.40	108	36	.14	95	120.5	
.45	98	35	.14	85	66.6	
.50	93	35	.14	80	59.6	
.55	92	35	.14	79	56.0	
11.	85	30	.12	72	55.6	
.05	70	30	.12	57	43.0	
.10	60	30	.12	47	34.0	
.15	58	21	.12	45	28.0	
.20	50	21	.08	37	14.5	
.25	40	20	.08	27	10.5	
.30	35	20	.08	22	8.5	
.35	30	20	.08	17	6.5	
.40	25	20	.08	12	4.5	
.45	20	20	.08	7	3.0	
.50	18	20	.08	5	2.0	
.55	18	20	.08	5	2.0	
12.	18	20	.08	5	2.0	
.05	16	20	.08	3	1.0	
.10	16	20	.08	3	1.0	
.15	16	20	.08	3	1.0	
.20	16	20	.08	2	.5	
					2645.	

By Table VI. we have an equivalent of 2645 cubic meters raised 1° C. for the opening of forty square centimeters area, and $2645 \times \frac{104}{40} = 6877$ cubic meters raised 1° C. for the other opening, making a total of 9522 cubic meters. This is equivalent to 2971 heat units, making a saving of thirteen per cent, or one per cent more than was obtained by the previous experiment recorded in Table IV.

Fig. 116, redrawn from Johnson's Encyclopædia, represents a ventilating fire-place exhibited in the English Department of the Centennial Exhibition of 1876. It is very similar to the Dimmick Heater in principle, though widely different in the appearance of the exterior and in the manner in which the heated air is introduced into the apartment. These two fire-places are not provided with set blowers, as is the case with the Fire-Place Heater, and with the various forms of the Baltimore Heater, so called. In the Fire-Place Heater a fire may be kept over night by replenishing with fuel before retiring and leaving all blowers wide open and the base draught damper slides closed. If it be desired to put out the fire altogether, the lower sliding-blowers and the base draught damper should be shut and the upper blower slide left wide open. On the other hand the fire may be made to burn out slowly where the chimney draught is strong,

by shutting all blowers. There will be sufficient inflow of air through crevices to burn out all fire before morning. Thus the fire is quite under control, and may be regulated to suit any condition by properly adjusting the blowers and the sliding dampers in front of the base of the stove. When these blowers are closed the Fire-Place Heater is somewhat similar in exterior appearance to the Baltimore Heater, but more inviting-looking for private houses as having less the appearance of a furnace in the arrangement of the blowers. The Baltimore Heater is said to have been invented about thirty years ago by Latrobe, and was for some time called the "Latrobe Heater." It is now manufactured by different firms under various names, prominent among which are the "New Silver Palace" and the "Baltimorean," made by Bibb & Son, of Baltimore, Md., the "Lawson's Fire-Place Furnace," manufactured by Fuller, Warren & Co., of Troy, N. Y., and the "Sunnyside Fire-Place Heater" of Stuart, Peterson & Co., Philadelphia. These heaters are really nothing more than small furnaces, set in an ordinary fire-place under a mantel. They have regular swinging furnace doors, provided with transparent mica panels arranged in tiers over each other like the windows of steamboat staterooms. They have, however, this great advantage over the ordinary furnace, that though they cannot be converted into an open fire-place at pleasure by simply sliding the blowers into side pockets, they nevertheless furnish direct radiation in that part of the house where it is needed and healthful rather than in the cellar where it is worse than useless. These heaters are provided with double flues to utilize the heat of the smoke in the manner already shown in Figs. 111, 112, and 115.

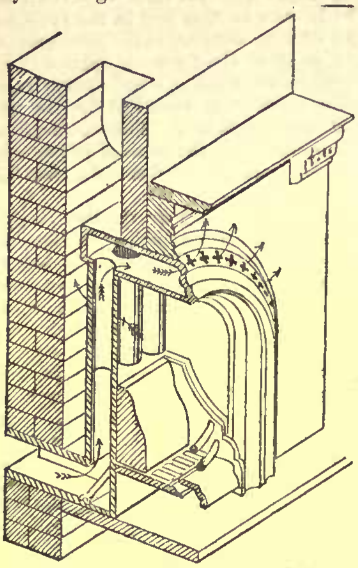


Fig. 116. Redrawn from Johnson's Encyclopædia.

Figs. 117 and 118 show a Yankee method of treating the Galton flue in a "tasty" manner. The outer pipe takes the form of "an elegant stove," and is placed in the room in front of the fire-place which is built for ornament and "closed up nicely with a screen." With all its tastiness, what a cheerless and uninviting effect is produced, and how false the treatment both artistically and economically! In one sense the design is true; the heat is generated by a stove below and by a stove above it is represented. But in every other sense it is false. The envelope has the form of a heat-generator without performing its functions of consuming fuel or producing ventilation, and the fire-place is a sham of the worst kind. Practically this treatment is in every respect contrary to the correct principles of heating, and the ventilation of the room is by it reduced to a minimum, notwithstanding the deceiving presence of the fire-place, even when unscreened.

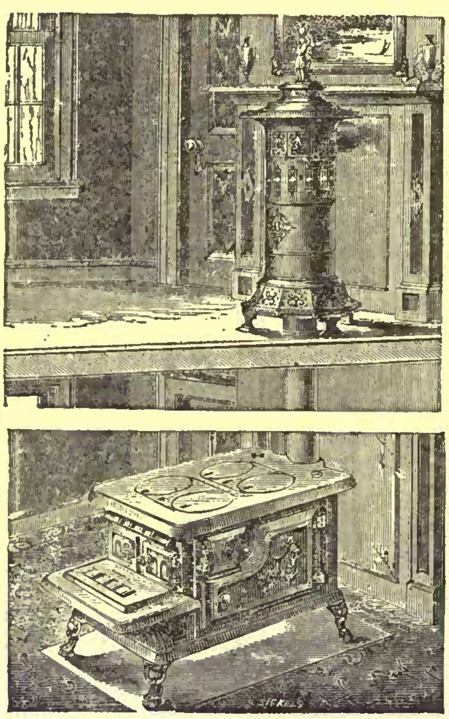


Fig. 117.

The radiator, instead of warming fresh air from the outside on its entrance, as it should, simply creates a feeble current in the neighborhood of the stove itself, without changing the air of the room, and what fresh air will find unwelcomed entrance must squeeze itself in through door and window cracks, contraband, and do what mischief it can in revenge for its cold reception before it is hustled out again through the fire-place opening. Hence no proper ventilating draught is produced by this fire-place, because no heat is generated there, and the imitation stove, having no fire of its own, is even more absolutely hostile to ventilation than the famous anti-ventilating German porcelain stove itself. It is worse than the ordinary stove, because it is necessarily hermetically sealed for the sake of the draught in the range below.

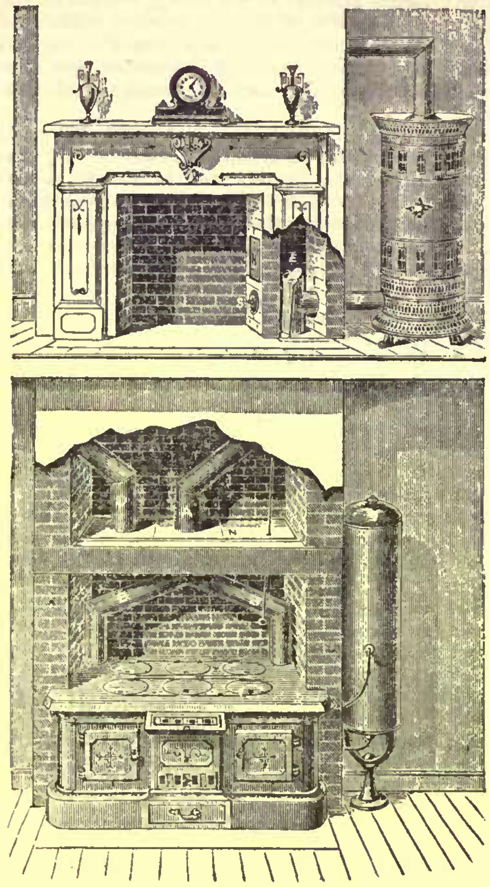


Fig. 118.

JACKSON'S VENTILATING FIRE-PLACE.

We come now to a form of ventilating fire-place which combines to a remarkable extent the desiderata heretofore set forth, and at the same time presents a most pleasing external appearance. In the front elevation (Fig. 121) we see apparently nothing more than the usual open fire-place with a frame decorated in a tasteful manner. The number and size of these openings regulate the size of the chimney throat which they form. The fresh air enters the room through the open-worked top of the frame at F. The section (Fig. 119) shows us the manner in which this fresh air is warmed. It enters the lower chamber B B through the register A, where it is partially warmed before it rises to the chamber surrounding the back and sides of the fire-place. Thence it enters the chamber D, where it plays around the short tubes forming the chimney throat, and passes thence through the perforated frame above described into the apartment. Fig. 122 shows the plan of the grate and the apparatus for shutting off the fresh-air supply. This latter consists simply of a disk of iron rotated by a lever so as to close wholly or in part the mouth

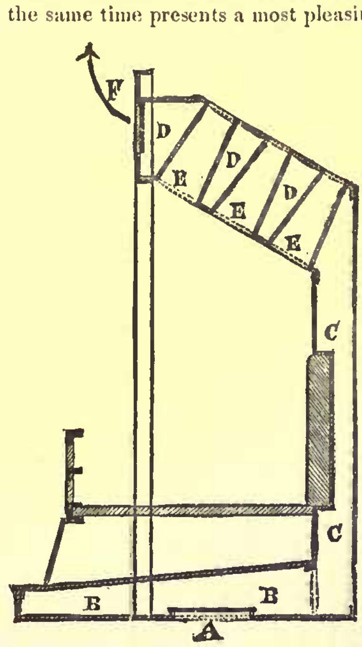


Fig. 119.

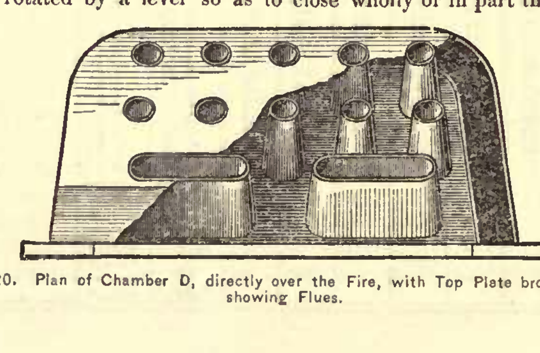
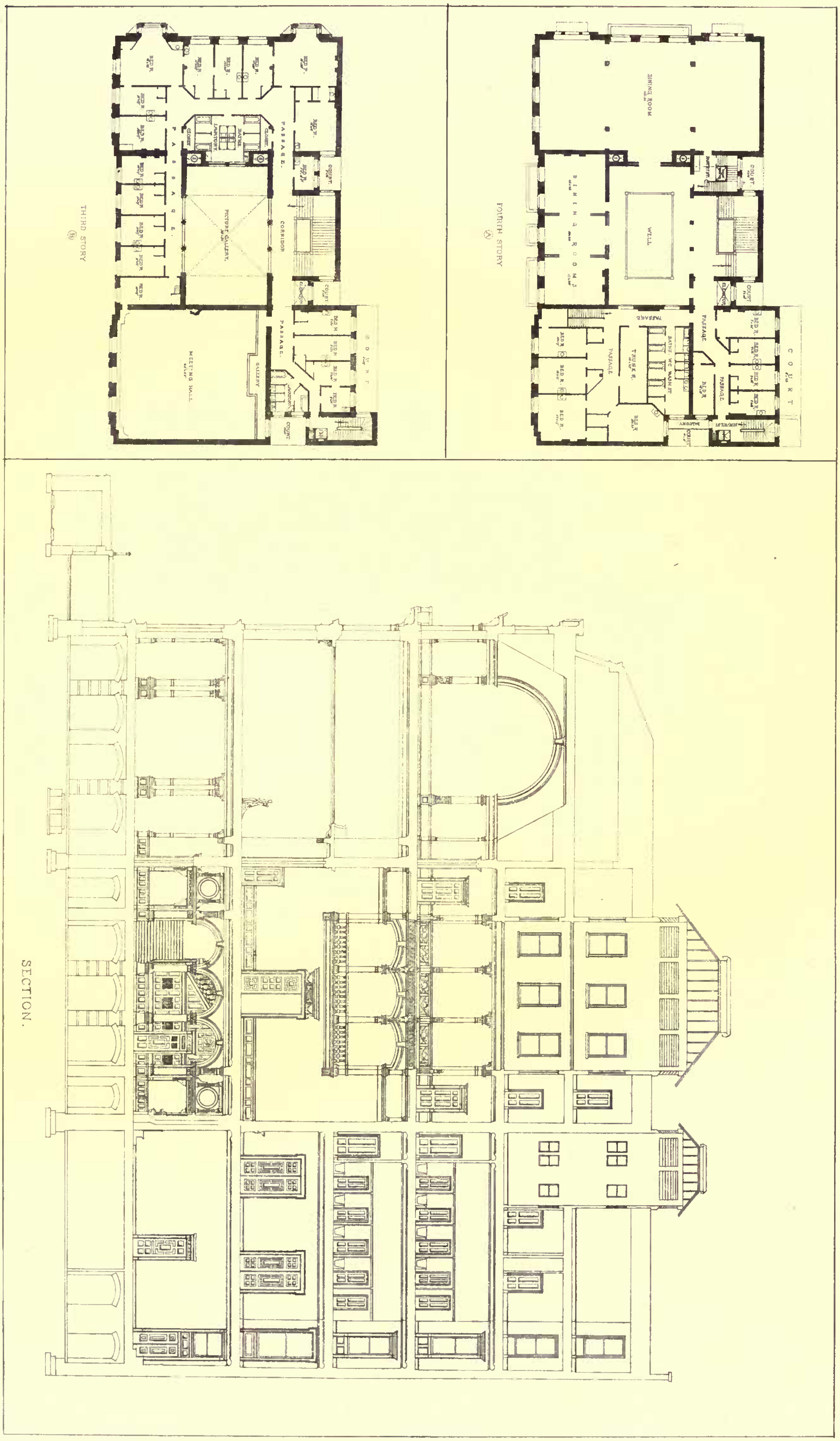


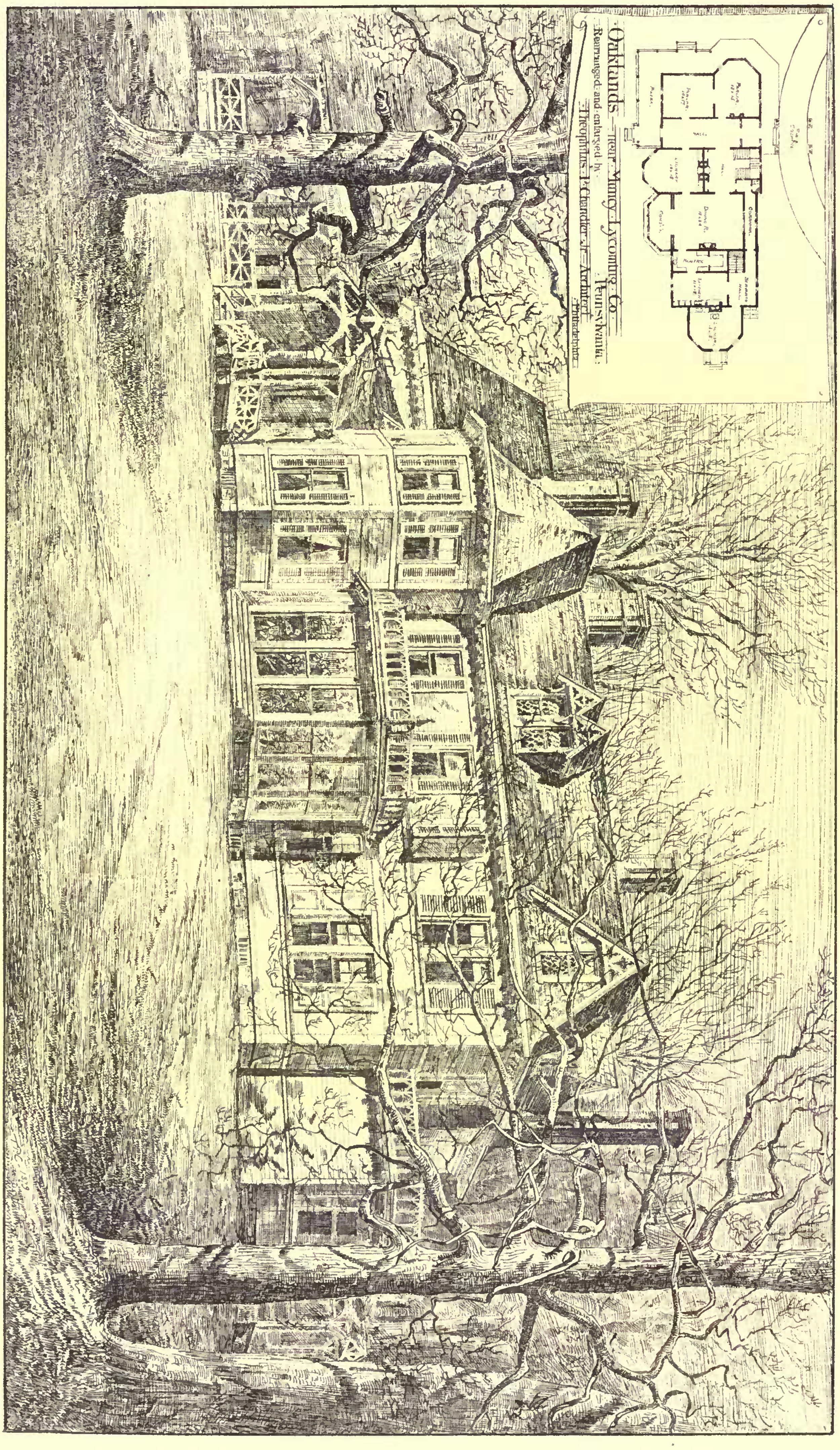
Fig. 120. Plan of Chamber D, directly over the Fire, with Top Plate broken away showing Flues.

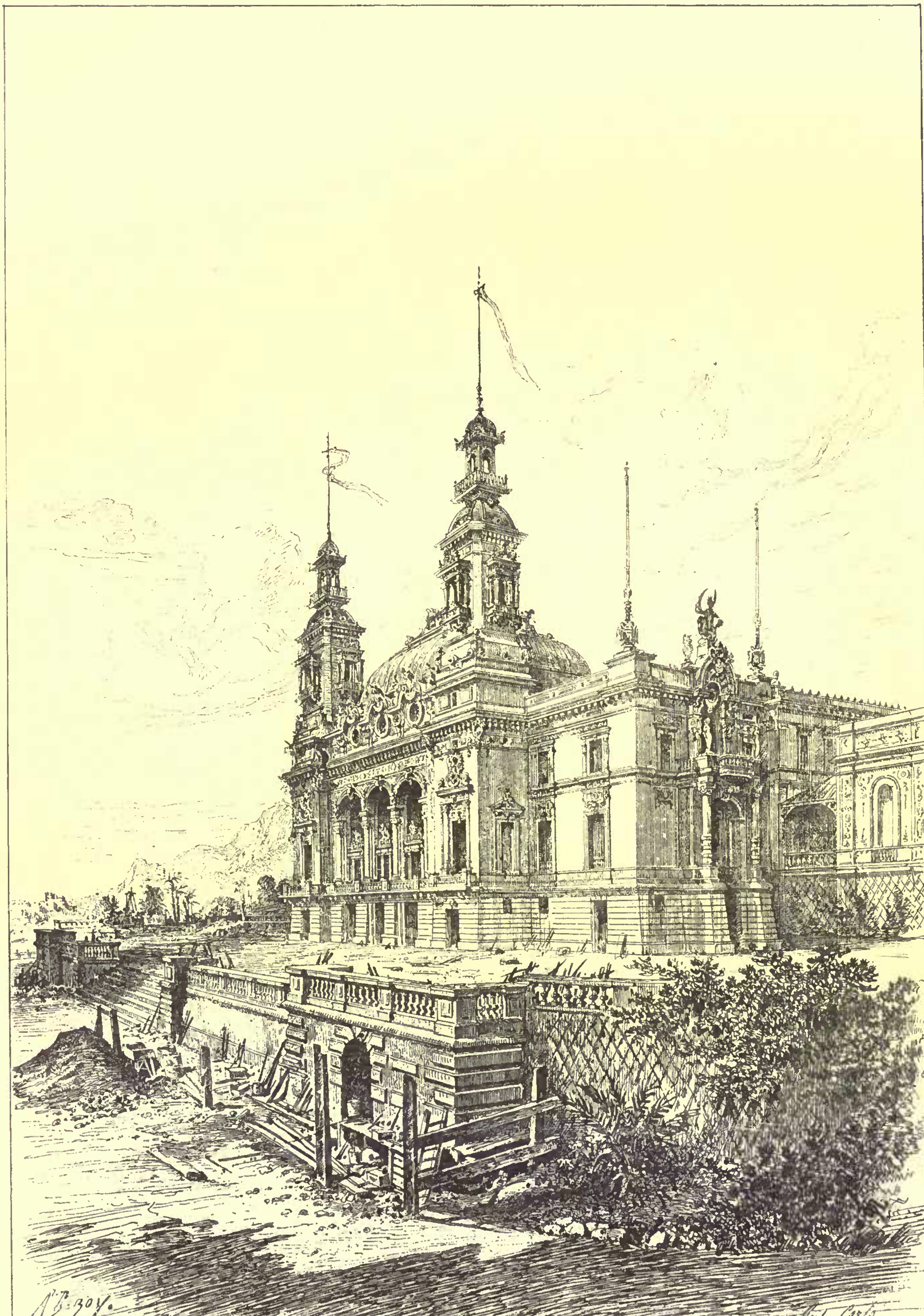


Design for the Union League Club-House New York

E. E. Raht, Archt.

The Heliotype Printing Co. 220 Devonshire St. Boston

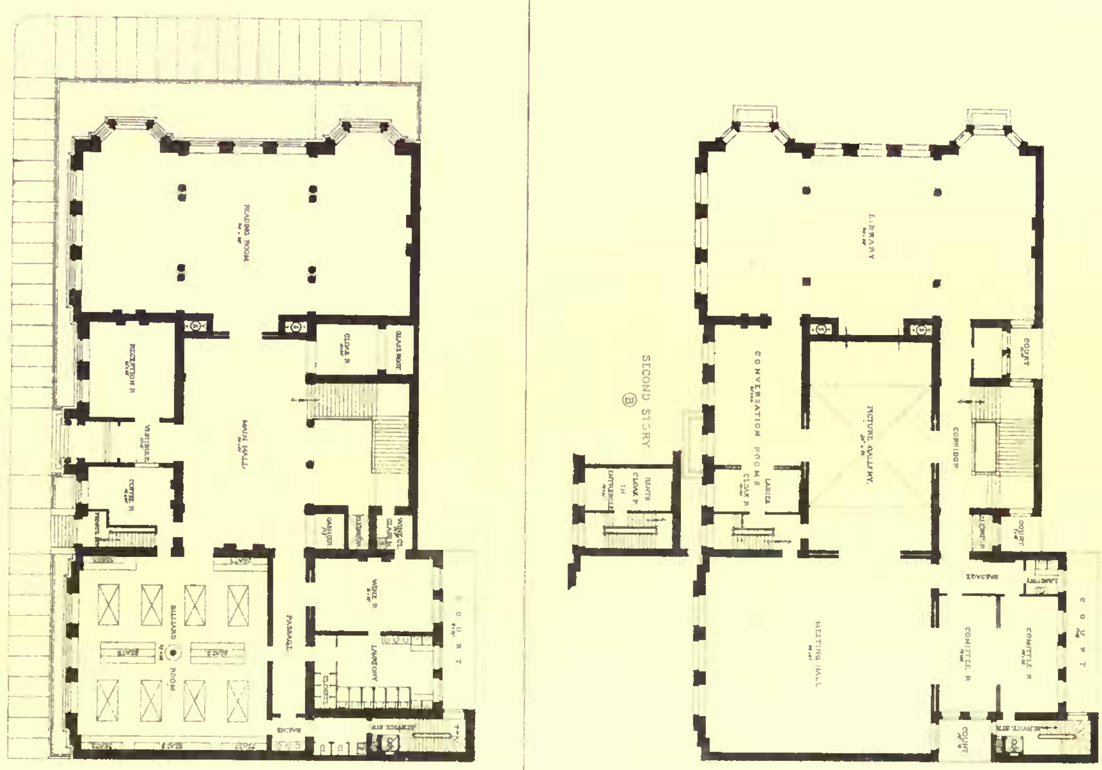

Oaklands — near Muncy, Lycoming Co. Pennsylvania:
Rearranged and enlarged by
Theophilus P. Chandler Jr. Architect
Philadelphia

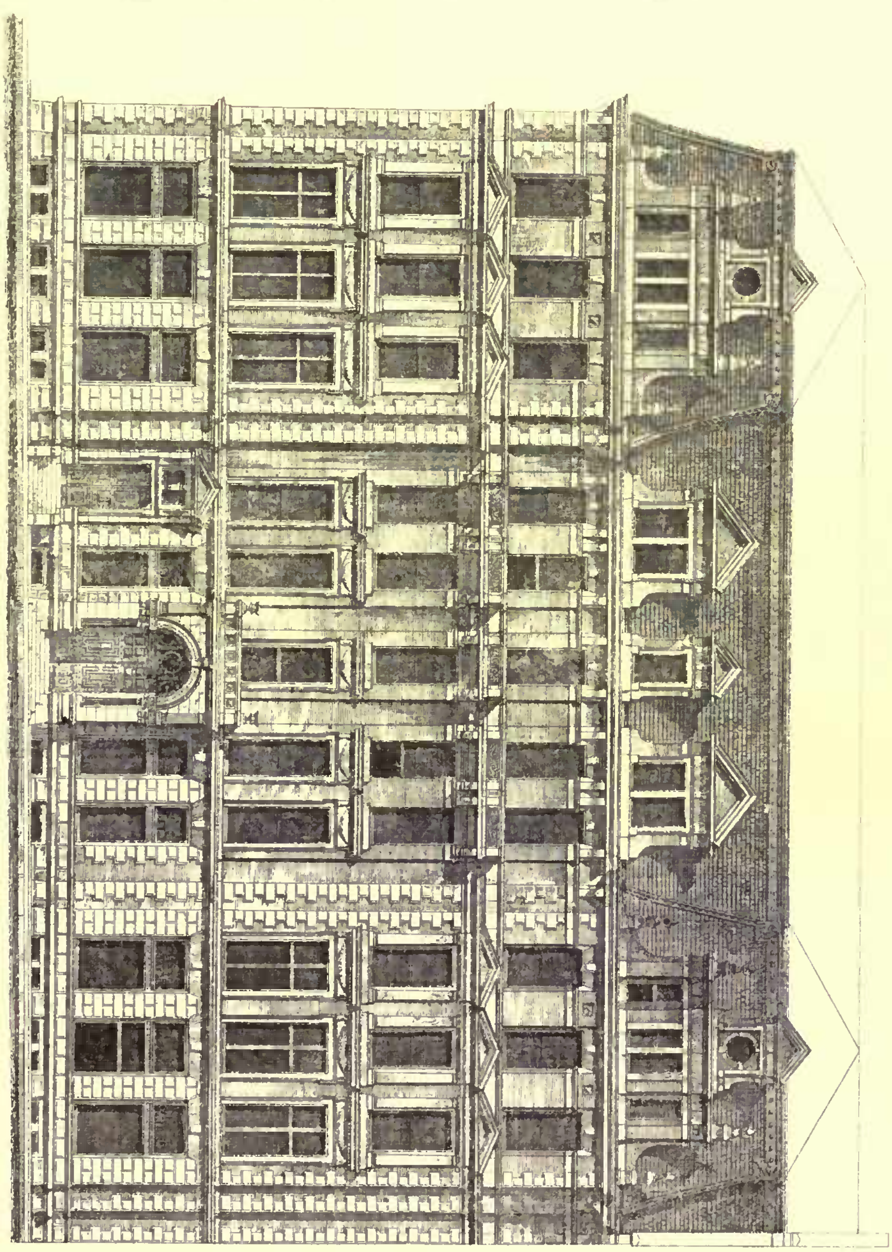


The Heliotype Printing Co. 220 Devonshire St Boston

THEATRE OF MONTE-CARLO
MONACO

M. Charles Garnier. Architect





DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK.

E. E. RAHT, ARCHT.

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON

of the fresh-air duct shown in section at A. Fig. 120 shows the

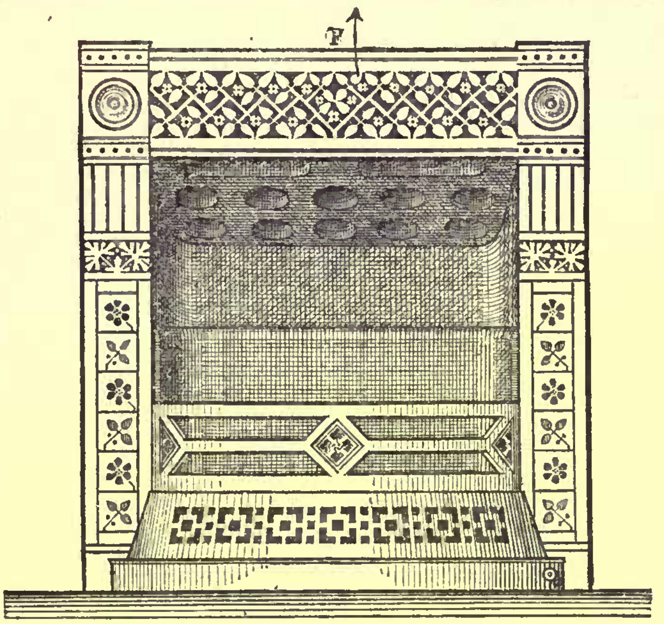


Fig. 121.

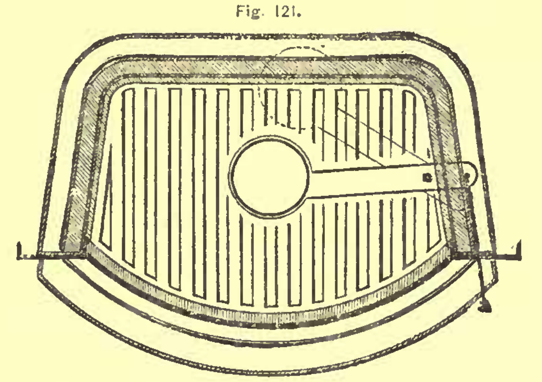


Fig. 122. Plan of Chamber B, directly under the Fire.

small smoke pipes in the chimney throat with the fresh-air chamber surrounding them.

THE ILLUSTRATIONS.

COMPETITIVE DESIGN FOR THE UNION LEAGUE CLUB-HOUSE, NEW YORK, N. Y. MR. E. E. RALET, ARCHITECT, NEW YORK.

THEATRE OF MONTE-CARLO, MONACO. M. CHARLES GARNIER, ARCHITECT.

IN *La Semaine des Constructeurs* for February 1, 1879, M. César Daly writes as follows of the theatre which we reproduce from a later number of the same journal : " The news of the hour is the opening at Monte-Carlo of the new theatre and concert-hall, which our confrère, M. Charles Garnier, has just built at the Établissement des Jeux. It is vigorous, masculine, rich, forceful, wonderful. The opera house at Paris was a prelude, a preliminary canter before the race, a mere preparation. The concert-hall at Monte-Carlo is the perfected fruit; it is the outcome, bewilderingly vigorous, of an idea long kept in abeyance, but which has at length escaped restraint ; it is the feat of a bold nature whose strong vitality asserts itself in a hardy song ; it is a rude bit, studied and executed in six months. The price matters not ; it may have been two or three millions. There was needed for Monte-Carlo, a rendezvous of unquestionable luxury, intermittent elegance, and constant pleasure, where are collected worldlings and pleasure-seekers, a style of art at once rich, pampered, and luxurious, even if somewhat expansive ; it was necessary to make the work splendid without being tiresome, full of warmth without being overpowering, full of light without being dazzling, and at the same time exciting and restful. As far as such a complex and even contradictory problem could be solved, M. Garnier has solved it.

" The hall is twenty metres square and nearly twenty metres high. The proscenium arch is nine metres wide and twelve high. The angles of the hall are cut off by walls almost four metres wide. From the floor to the top of the cornice is nearly twelve metres (11.80 m.), which leaves for the coving which connects the walls with the ceiling seven metres and a half, — a large proportion, when we consider the size of the hall, although the effect is excellent. In perspective it seems as if the developments of the two opposite coves and the horizontal portion of the ceiling were three nearly equal portions, one of which, the ceiling, is richly framed about, with garlands hanging vertically, here and there, and well detached from the ceiling. Attached to the four angle walls are elegant balconies, or projecting boxes, elliptical in form, and nearly four metres wide. Opposite the stage, in the axis of the hall, is the box of the prince of Monaco, which projects in a semicircle farther into the hall than the others, although it is not quite so wide. The angle walls play an important part in the composition. Under the elliptical boxes are broad niches, somewhat too low, which are well lighted and contain large vases of flowers. Above the boxes runs the cornice, which carries garland-holding figures, who are separated one from another by large cartouches ; while above all, in the angles of the coves, where they serve to unite them, are large figures of Fame, with extended arms and long palm branches. Resting on the cornice over the four main walls of the hall are three bull's eyes, vigorously treated, which form a rich crowning member. The space on each cove between these bull's eyes, each pair of Fames, and the frame of the ceiling, forms the field for pictures which have been painted by M. Clairin, who has represented the Dance, M. Lix, who has painted Comedy, while M. Boulanger has represented Music, and M. Feyen-Perrin the Song.

" The sides of the hall are occupied by three arcades which are surmounted by the cornice and the bull's eyes. On the right, towards the sea, they are glazed, but on the left they are filled with enormous mirrors, while ample draperies hang on each side. In this way the sea, which can be seen through the windows on the right, is reflected by the mirrors on the left, so that the hall appears to be surrounded by the sea on all sides.

" The prevailing tone of the hall is tawny, with touches here and there of golden green, yellow, and red, so skilfully handled that the effect is mellow. Nowhere is the eye offended by the harsh reflection from metallic surfaces, yet it would be difficult to obtain a greater richness of effect. This effect of repose in the midst of so much luxury, this domination of the principal lines and masses over details in such vigorous relief, is a victory over a really great difficulty. In short, considering the public for whom it was built, its picturesque site, its aim, etc., I consider this work of Garnier's a very real success. In my opinion, looking at it from the point of view of maturity of talent, the theatre of Monte-Carlo is superior to the opera house at Paris, and in fact I do not know a theatre, the proportions and special circumstances being taken into account, which is as good as the theatre of Monte-Carlo."

OAKLANDS, NEAR MUNCY, PA., REARRANGED AND ENLARGED BY MR. T. P. CHANDLER, JR., ARCHITECT, PHILADELPHIA.

ON THE RELATION OF ARCHITECTURE TO UNDERWRITING.[1] III.

IT now remains only to describe the causes of the rapid spreading of fires through buildings, and the precautions to be applied in preventing them.

The main cause is the want of a proper system of compartments, whereby a fire can be confined to the place where it originates until it is extinguished. This is the prevalent fault in the planning of all business buildings ; and this is the very class in which such precautions are most needed. Those features of modern buildings which are most fruitful in disasters are open elevator-wells, light-holes, and stairways. The two former are most dangerous, because they are continuous vertical openings, while the latter may not be continuous, and may offer some obstruction to direct upward drafts.

It is often asked why the dangerous nature of elevators has become so much more evident lately than it was a few years ago. From some experience in connection with elevator protection, I will suggest this explanation. In stores and warehouses interior hoisting apparatus has been in use ever since the antiquated external cranes were abolished, perhaps for forty years, during which time most existing stores and warehouses in American cities have been erected. But until within about ten years past the hoistways consisted of square openings in the floors, through which a rope and hook were dropped from a windlass at the top, the windlass being worked by an endless rope passing over a wheel. These floor openings commonly had trap-doors of wood hinged on one side, so that they could be opened and closed with facility. The modern elevator, which has been supplanting these inconvenient hoists, consists of a movable platform counterbalanced with weights, and operated either by hand, steam, or water-power. The guides, safety appliances, counterbalances, and additional ropes, required by this improved machinery, occupy so much space in the well-holes that the use of trap-doors has become extremely inconvenient and in some cases impossible. Hence, where before the traps were closed at night, there are now none to close, except in a few instances. When elevators are put in, trap-doors disappear immediately. Hence we constantly hear of increasing " elevator fires."

The remedy for this state of affairs is not easy, still the question is capable of solution. What is demanded by the present exigency is that not only should some provision be made for closing these dangerous openings, but that human thoughtfulness should not be depended upon, and that the power so skilfully used to propel elevators should also be applied to operate traps or valves automatically.

[1] A paper read before the New York State Association of Supervising and Adjusting Insurance Agents, at Syracuse, May 20, 1879, by Mr. P. B. Wight, architect.

The number of inventions having the accomplishment of this in view is almost legion. In the neighborhood of fifty patents for automatic hatchway-closers have been filed in the Patent Office already. Until recently but few have been put into practical use, and most of them have proved to be failures. A few were introduced in Boston after the fire of 1872. None have ever been used in New York with success. A few, applied to small elevators, have been recently tried in Philadelphia. Of a number introduced in St. Louis four years ago, where the local board allows a rebate for them, but one is now working. In Chicago one kind was attempted seven years ago, and failed. It is only within the last eighteen months that the problem has been successfully solved in that city, and now it has more elevators provided with automatic closers than all the other cities together. Two kinds are there used, one the Meaker, the other the Van Osdel hatch-closer.

A large number of mill buildings in the New England States have been furnished with automatic closers, especially adapted to the simple styles of elevators there used, but not such as could be applied to the large steam and water elevators used in our modern warehouses. Besides the above, the Meaker automatic doors have been successfully applied to many brick-shaft elevators in Chicago and Milwaukee. Brick shafts for elevators should always pass through the roof, and be sufficiently open at the top to allow smoke and flames to escape.

Light-holes and light-shafts are fully as dangerous in conducting fires as elevators. In business buildings enclosed light-shafts with openings in the sides should never be allowed, unless constructed, like interior courts, with brick walls and open at the top. If light-holes and skylights cannot be dispensed with, all such openings should be arranged to be covered at night on every floor with movable shutters, or blinds, sufficiently fire-proof to resist the upward draft of a fire in its earlier stages. It is entirely practicable to provide these, and a mechanism may be used which will enable a person on the ground floor of any building to close all such openings, simultaneously, by turning a wheel. Skylights over such openings should always be of heavy glass, in metal frames, and covered with strong wire-work, to resist falling bodies. Stairways in stores and warehouses can only be made safe against the intrusion of fire by enclosing them with fire-proof partitions, and placing a door hung with spring butts and covered with sheet-iron or tin on the outside, at the foot of every flight. This is far preferable to letting down traps at night, because such traps would interfere with the free passage of firemen.

Care should be taken that no vertical air-boxes, chutes, enclosures for elevator ropes or weights, or other open constructions of wood, are introduced in any building. The covered channels used to contain steam, water, or sewer pipes are fruitful sources of danger to all buildings, and should be avoided by having such pipes exposed and closing the floors around them. Another danger to which all buildings containing machinery are exposed is found in the openings made in floors for belts or shafting. These should be reduced to the minimum. Systems of ventilation, also, which may be good in themselves, frequently conduce to the spreading of fires.

Unless due attention is given to closing all vertical openings, such as those here indicated, — and they by no means comprise all, — the construction of fire-proof ceilings and floors will be of little avail, and will not be worth the necessary expenditure.

But even if these precautions are observed, the absolute safety of the larger business structures can be preserved only by a proper system of subdivisions or compartments. The necessary size of such compartments will vary according to the use required of the building, but the smaller they are the better. The divisions may be made with either brick walls, or the various styles of fire-proof partitions that have been described. All openings in such partitions should be closed, either with iron doors on both sides, or a heavy sliding wooden door, covered with tin or sheet-iron on both sides. A recent invention provides for closing such sliding doors automatically. They run on inclined ways, so that the force of gravity will close them. The melting of a fusible link in a chain stretched across the top of the opening will release the doors and allow them to close by their own weight.

In conclusion, allow me again to call your attention to a sentence contained in the earlier part of these remarks. I expressed the hope that I might enable you, as insurers, to see more clearly what you have to contend with in assuming fire risks, and what, if you desire to diminish those risks, you may *reasonably demand.*

It is you, gentlemen, who hold in your hands a power to control the method of erecting modern buildings greater than all others combined, and which, if wisely directed, will speedily reform all the abuses you complain of. I know that in what I am about to refer to I touch upon the vital and all-absorbing point of dispute which has held possession of every convention of underwriters, national, state, or local, that has been held during the last three years. Nor do I pretend to take part in your discussions of it. The necessity for alluding to it on the present occasion only shows how it ramifies every subject in any way related to fire insurance. I need hardly add that it is the question of rates.

You may not only "reasonably demand" but *enforce* these reforms. The obstinate and tight-fisted citizen always stands ready to contest the building law, but will yield to the money argument, if you are firm in your demands. There are but few so foolish that they do not insure, and therefore few escape your overreaching grasp. You gather them all into your fold. They put their burdens upon your backs and you assume all their risks. The philosophic business man says that his property is his own until fire comes, and then it is yours. He takes no risk after he pays you his money. It is your interest and business alone that he shall not be burned. You must stand on guard over his property, and send out your patrolmen to see that no carelessness on his part results in the burning of it. The proprietorship, so far as all danger of fire is concerned, is transferred to you. If you rightly protect yourselves, you must put a money value on every item of negligence to provide against the incipiency or spreading of fire in his building. If you estimate these rightly, he will soon see the force of your arguments. Reforms will follow without further discussion, or the interference of the law.

Now, if you ask how this concerns the architects, I will quickly tell you. They have recently been the targets of much indiscriminate abuse; some of it merited, but most of it misdirected. It is only within the past few weeks that a discussion of many points in connection with the relation of architecture to underwriting has arisen between the president of the largest mutual manufacturers' insurance company and the *American Architect*, which is the honored organ of the architectural profession in this country, and I would respectfully ask you to peruse it in the columns of that paper. This profession is on trial and will not shirk its responsibilities. Though in individual instances it has been guilty of grave faults, it has this whole question deeply at heart. The improved construction of modern buildings with reference to limiting the dangers from fire is mainly due to the influence and invention of the architectural profession. The only exception that I know of is in the construction of mill buildings, and therein the mutual companies which make a specialty of that branch of insurance have not failed to do their duty to themselves and those whom they insure.

You stand between the architect, who wants to do what is right, and his client, who wants to do what is cheap. When you have demonstrated to the client that his parsimony is subject to an annual tax thereafter, he will quickly figure up both sides of the case, and find wherein his interest lies. If it is in the direction of a secure system of building, he will correct his errors as far as possible, and remember to avoid them the next time he builds.

When you throw your influence and power into an effort to reform prevalent abuses in the art of building, and thereby prevent these extensive conflagrations, you will always find the architects on your side; and I cannot help thinking that you might sometimes profit by taking them into your councils and availing yourselves of their experience. Interchange of ideas cannot fail to be of advantage to both professions. Hundreds of busy heads are constantly studying these problems, and vast additions are continually making to the store-house of human knowledge. The constant agitation of the fire question cannot but have a healthy result; and I trust that the time is not far distant when we may all lie down in our beds with the satisfactory assurance that our rest will be unbroken by the fire-fiend, and that we will rise again in the morning without dreading the fearful announcement that our earthly possessions have been swept away during the night.

CORRESPONDENCE.

BUILDING ACCIDENT.

CINCINNATI, O.

THE shocking accident at Post & Co.'s building on June 5, which entailed such a sad loss of life and property, is another evidence of the need and necessity of a thorough code of building laws in this city.

Here was a building five stories high, sixty feet on one street and forty feet on another; its floor joists resting on brick walls at one end and on wooden girders at the other, and these girders, in their turn, supported by wooden columns. It was used for the manufacture of railroad supplies; certainly as heavy a business as usually falls to the lot of the average building.

In the middle of the night this building took fire, and all the timbers were charred, more or less, from top to bottom; moreover, it was drenched with water, much weight being added thereby to the already over-burned and weakened supports. It was not yet cooled off when some thirty or more employes of the firm were sent in to clean out things "so as to go to work to-morrow," as one member of the firm is made to say in the public prints. Perhaps these thirty odd men working in the thoroughly soaked building were the last straw; be this as it may, the top floor gave way, and, in its turn, carries to destruction the floor below, and so on; the building becoming a total wreck.

The firm (who lease the building) claim that prior to sending their men into the building they, together with the insurance adjustor, called in Mr. J. W. Cotteral, a prominent and experienced builder of the city, to examine the building and see if things were safe, and that upon his report, the cleaning out was commenced. Mr. Cotteral, on the other hand, says that he was called in by the *owner* of the building to undertake the necessary repairs to put it in proper condition for occupancy; and that he was not questioned as regards the safety of the building, and consequently gave no opinion upon that matter. There is no question but that he examined the building, and having examined it, the question naturally arises, was it not his duty to in-

form the owners and others interested as to its insecurity? However, there seems to be a conflict of statements that only the official investigation can fully decide. All this leads us to reiterate that there appears to be no commission here whose duty it should be to inspect such and all other insecure buildings. To be sure, we have what is termed a "Board of Insecure Buildings," but their knowledge of the strength and purposes of building material hardly comes up to the law's allowance.

The loss in this disaster is six men killed outright and fifteen wounded, and the total destruction of the building and stock, which, as yet, is not stated in dollars and cents.

THE INTER-OCEANIC CANAL.

EACH route has its champion, who can prove satisfactorily to himself, at all events, that his particular plan is undoubtedly the best. Any one who has read the published accounts will remember that the chief obstacle is, in every case, either a proposed tunnel or a series of locks over the mountains. At this point the following questions seem to arise naturally: Why have these places been selected rather than any others, — such as Chiriqui, Sassardi, Carreto, or a dozen other locations? How have the surveys been conducted?

A good harbor or a navigable river, old Spanish or Indian traditions, have commonly determined the general route. The lines have usually been run up some river bed as far as possible, or on its banks, and when "headed" a straight across-country line cut through the woods to the nearest water-course on the other side of the ridge, — transit and level lines very likely, by entirely competent engineers. This method gives one point on the ridge. Doubtless fogs prevent at all times any special study of the topography from the sea. and, after landing, the jungle forbids any but straight lines, or simple meander of water-courses. At the same time, as the high land is reached the underbrush sensibly diminishes, and a comparatively small amount of cutting on the summits allows quite extended views. The coast lines on both sides of the isthmus seem to have been reasonably well located. Of certain portions (in connection with some of the canal schemes) there are quite thorough plane-table and hydrographic surveys, and as a whole may be considered as far enough advanced to be worthy of serious consideration and preliminary estimates.

The inland field work, on the contrary, can scarcely be classed, even by those who have had charge, as anything other than simple preliminary lines, the surrounding topography having been, as a rule, either entirely neglected or nearly so. It has been stated that each line run across the mountains gave one level on the summit. In round numbers there are four hundred miles of isthmus between Costa Rica and the Atrato-Napipi line, through which the Congress seem to have considered but two lines, Wyse's line near the Panama Railroad, and Kelley's line at San Blas. Two summit levels, and those fifty miles apart, are the only ones in a distance of four hundred miles. If from the summit, say on the Panama Railroad, transit and level lines be run parallel with the coast, on the top of the watersheds, working toward both continents, the result would be a positive determination of the summit levels all along, instead of, as at present, perhaps one level for every hundred miles. That such lines are feasible below Panama there is no doubt, and probably but little as far north as Costa Rica.

Granted for a moment that such water-shed lines can be run out, would not a plan of the isthmus with a line of actual levels down its entire water-shed length, plotted in connection with existing coast surveys, make the only reliable basis to work upon? Blanchet's Nicaragua route is the least costly of those before the Congress, and this with an estimate of $82,200,000. One hundredth part of that sum ought to show conclusively whether a cheaper route could be found anywhere on the lower six hundred miles of the isthmus.

Without further actual field work, American engineers will be slow to believe that the best location has yet been found. — *Ernest W. Bowditch in the Boston Daily Advertiser.*

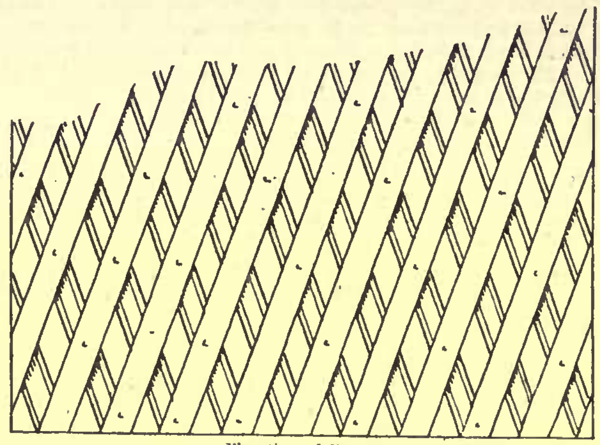
FIRE-PROOF PARTITIONS.

WASHINGTON, D. C., June 2, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

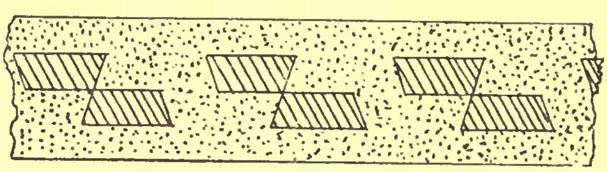
Dear Sir, — You publish from time to time notes on fire-proof construction. I have in my practice for some years used a cheap and effective fire-proof partition, instead of the ordinary stud, lath and plaster partition, which in construction has many flues through which drafts carry fire rapidly all over a house. It costs little if any more than the common inflammable partition, and is practically fire-proof.

The skeleton of this partition is made of strips of sawed lumber about from $\frac{7}{8}$ by $1\frac{1}{2}$ to $1\frac{1}{4}$ by 2 inches. They are set up as a lattice partition, leaving long lozenge openings like the meshes of a net, which should not generally be more than 2 inches wide. The common plaster mortar is spread on one side, and when this is set the other side is plastered. The key is good, for the two coats of mortar unite. The wood, which is a narrow strip, is perfectly imbedded in the mortar so that it cannot be burned, even by exposure for a considerable time to a hot fire. There are no flues to carry fire to the top of the building into the roofs and floors. While the two diagonal sets of wooden strips should be firmly nailed, fewer nails are consumed than in securing laths on the upright studs in common use. It is well to place the strips at an angle with the vertical, of about 20°, *i. e.*, between 45° and the vertical. It is also well, though not absolutely necessary, to cut the strips of trapezoidal form, and to place them



Elevation of Frame. Scale 1 in. = 1 ft.

with their mortar sides to the outside of the partition. Thus each strip acts as a key to hold the plaster.



Horizontal Section. Scale 3 in. = 1 ft.

These partitions are very stiff when finished in hard finish. For upper rooms $\frac{7}{8}$-inch lumber is sufficient; for lower rooms, which carry the weight of floors above, $1\frac{1}{4}$-inch is stiff enough. A partition of $\frac{7}{8}$-inch stuff will be about three inches thick, or of five-quarter stuff $3\frac{1}{2}$ inches thick, which effects an economy of space in a house, enlarging the rooms without weakening the partitions, which are usually not less than six inches thick.

Very respectfully your obedient servant,

M. C. MEIGS, Quartermaster-General,
Bvt. Major-General, U. S. A.

[The partition here described will commend itself at once for its fire-resisting quality, and ought to be as much a barrier to sound as the ordinary partition. Of its lateral stiffness, as to which we should have had some misgiving, General Meigs's testimony is decisive; and it must have considerable vertical strength, so as to sustain itself unsupported, without further trussing, unless pierced or heavily loaded. We should have fears, nevertheless, for its serviceableness in permanent constructions, on account of the danger of dry-rot, which would make it treacherous, and might destroy its strength in a few years. — EDS. AM. ARCHITECT.]

THE GRAND CENTRAL DEPOT ROOF AGAIN.

NEW YORK, June 7, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — It is with considerable reluctance that I again refer to the question of the part the late Mr. R. G. Hatfield took in designing the roof of the Grand Central Depot in this city. It is a subject which can be of very limited interest to you, sir, or to your numerous readers. But your correspondent, "H.," having claimed that my brother had nothing whatever to do with designing the roof in question, I propose, with your permission, to put on record a phrase or two from the numerous memoranda on the subject in my possession, which, I think, fully justify me in the statements made in my communication of April 28.

On the 11th day of January, 1870, he was consulted by Mr. Nathaniel Cheney, the Vice-President of the Architectural Iron Works of this city, as to the best form of arch to be recommended for adoption in the construction of the trusses for the proposed roof of the new depot. On the day following he met Mr. Buckhout and Mr. Duclos, at the station then in use at Twenty-sixth Street and Fourth Avenue in this city in consultation upon the subject. He was there shown two sketches of trusses for the roof, made some preliminary rough calculations of the resultant strains, and gave it as his opinion that of the different forms proposed a full arch was by far the best. Mr. Hildeberger, an engineer, had suggested a crescent-shaped, arched truss, of great depth at the crown, but very narrow at the lower ends, and resting upon columns at a considerable height above the ground. This he disapproved of as subjecting the material to unnecessary strains; and expressed himself as greatly preferring a full and nearly semicircular arch. The other sketch was by Mr. Duclos, and approached more nearly the form of a semicircle.

On the 13th, Mr. Duclos and Mr. Hildeberger called at his office, and he then explained to them why he considered a full arch better than a segment. On the same day he visited the Harlem R. R. Depot, and saw Mr. Buckhout, the engineer of the road, and

consulted farther with him about the roof. He then commenced a study of the strains involved, and continued it for several days. Finally, the form recommended by him having been adopted, he called on the 18th upon the proprietors of the iron works, and claimed that as he had become as it were responsible for the stability of that form of arch, he ought to be employed by them "to design it." "They engaged me to do so," he wrote the same day; and he immediately proceeded to make the necessary investigation as to what modification of the full semicircle, if any, would be required. On the 20th he reported that the sectional area of iron in the rib would require an average of thirty-five inches, and that the horizontal thrust at the bottom of the truss would not exceed 75,000 pounds.

On the 25th he wrote to Mr. Cheney, calling attention to the necessity of having the truss conform to the arc of equilibrium due to the weights to be carried, which indicated a form departing somewhat from that of the semicircle. The various diagrams which he had made at the time to determine these strains are now in my possession, and are signed by the initials of his draughtsman, and also contain the date. He continued to be consulted from day to day, in regard to the construction of the roof, up to the month of June of that year, and frequently visited the depot to inspect the work.

I submit, therefore, whether this record looks like that of a man who "had nothing whatever to do with designing the depot roof."

Very respectfully yours,

O. P. Hatfield.

PUBLICATIONS RECEIVED.

The Hypæthral Question. An Attempt to Determine the Mode in which the Interior of a Greek Temple was Lighted. By Joseph Thacher Clarke, Architect. Papers of the Harvard Art Club, No. I. Harvard College, Cambridge. 1879.

Notes on Building Construction: Arranged to meet the Requirements of the Syllabus of the Science and Art Department of the Committee of Council on Education, South Kensington. Part III. Materials. Advanced Course, and Course for Honors. London, Oxford, and Cambridge: Rivingtons. 1879.

Cameron's Plasterer's Manual. Containing Accurate Descriptions of all Tools and Materials used in Plastering; Description of the Appearance and Action of Every Variety of Lime and Cement; Instructions for Making all Kinds of Mortar; Instructions for Doing all Kinds of Plain and Ornamental Plastering; Cistern Building; Form of Contract; Useful Tables; Many Important Recipes, etc. With Illustrations. By K. Cameron. New York: Bicknell & Comstock. 1879.

Ames's Alphabets. Adapted to the use of Architects, Engravers, Engineers, Artists, Sign-Painters, Draughtsmen, etc. By Daniel T. Ames. New York: Bicknell & Comstock. 1879.

NOTES OF EXPERIENCE AND INEXPERIENCE.

24. Weather Strip. — "T. M. C." can obtain weather strips of Foster S. Sheverick, Falmouth, Mass. Probably he can inform him where he can get them nearer Boston. O. F. Smith.

25. The American Institute of Architects. — Will your valuable journal, or some of its readers, inform me how I can obtain rules and regulations as adopted by the "American Institute of Architects" of New York city? And oblige a new practitioner, J. E. D.

[The Secretary of the American Institute of Architects, Mr. H. M. Congdon, 111 Broadway, New York, N. Y., will gladly furnish the desired information. The rules regulating the professional practice, and charges adopted by the Institute, were published in the *American Architect* for June 2, 1879. The American Institute of Architects, by the way, is a national association, and is represented in New York and other large cities by chapters. — Eds.]

26. White Incrustation on Brickwork. — Would you have the kindness to inform me of the best means to prevent the outcropping of saltpetre on fine brickwork. This spring we had sudden warm weather after frost, and as an apparent consequence *every building*, else not covered, was then full of saltpetre; the black joints in particular were white, and now the spots are dirty. If this cannot be prevented, then there will soon be an end of good brick buildings. J. Baumann.

NOTES AND CLIPPINGS.

A Fire-Extinguishing Liquid. — Some years ago at the burning of a tar distillery Mr. Watson Smith discovered that crude ammonia water, or gas-liquor as it is called, thrown upon the fire, which was raging violently, quenched it almost instantly.

A Large Block of Stone. — One of the largest blocks of granite ever cut in the United States has recently been taken from the quarry at Vinalhaven. It is fifty-nine feet long, five feet and a half square at the base, and three feet and a half square at the top. It weighs from seventy-five to one hundred tons. It cost $1,700 to quarry it and move it to the shed where it is to be finished. It is to form the shaft of the monument to General Wool, to be erected at Troy, N. Y. The shaft with the base stones will form a structure about seventy-five feet high.

A Belgian Pantheon. — The *Anglo Belgian Correspondence* states that it is proposed to celebrate the fiftieth year of Belgian independence by building on one of the heights in the neighborhood of Brussels "a huge Pantheon after the style of Westminster Abbey, to contain the portraits and statues of the great men — statesmen, generals, artists, writers, and philanthropists — of Belgium."

Yellow-Fever and New Orleans. — We do not know whether the auxiliary Sanitary Association of New Orleans is a private or a public body, nor do we know to what it is auxiliary; but it seems to be bestirring itself very actively and successfully in doing what is possible to keep yellow-fever in check during the coming season, though it is not to be expected that it can be kept out of the city altogether. The prospect seems to be very encouraging, for the finance committee of the association reports its expenses at $4,000 and its receipts at $28,900. This income is the result of private contributions and in a great measure is derived from various excursions on land and river, which have been organized by the association, and receive the ready support of the pleasure-loving citizens. Among the most important precautions undertaken is the systematic daily flushing of the street gutters with river water, which is easily accomplished by stationary engines, and by a number of tug-boats which have been chartered for the purpose. This action of the association seems to have suggested a new idea to the inhabitants, for they are reported to turn out daily to clean their house-yards and banquettes, so that it may yet become the duty of the New Orleans house-servant to clean and wash his sidewalk and gutter every day, as it is the duty of such servants in Baltimore. The purchase of street-sweeping machines and garbage boats, the distribution of disinfectants, and the ferreting out and abating of all sorts of nuisances, are amongst the good things undertaken by this association.

Statues for Lichfield Cathedral. — The action of the municipality of Paris in seeking to provide statues for the niches on the façades of the Hôtel de Ville, which we mentioned a short time ago, finds its antithesis in the course which the Dean and Chapter of Lichfield Cathedral propose to take in order that they may fill the niches in the newly restored west front of their cathedral. There are one hundred and eight of these niches, and as it is impossible to supply the statues out of the diocesan funds it is proposed that each statue shall be given by some person, as it is easy to see that in this way the work is more likely to be accomplished than if a general subscription were to be opened. Thus any person who may be willing to give $225, which is to be the cost of each statue, can ensure the perpetual association of his name with the cathedral. The Dean and Chapter have decided wisely to keep the control of the scheme in their own hands, and have prepared a list of saints, kings, prophets, and other Biblical personages from whom each person may select the one whom he prefers to honor; but, and in this lies the contrast with the French scheme, the Dean reserves the right of selecting the sculptor and regulating the style, so that all may have a certain uniformity and be in consonance with the building.

The Electric Light at Billingsgate Market. — The experiment of using the Jablochkoff candle in the great London fish-market has proved a failure, not because it was too expensive or because it did not give enough light, but because the people who dealt there having become accustomed to examine their purchases by gas-light — for most of the trading is done between three and four o'clock in the morning — could not understand that it was the effect of the electric light only which made the fish, just caught, look as if it had been lying in the stalls for days instead of hours, and so insisted that they would give only half the usual prices for all they bought. The fish-mongers, finding that their profits were dwindling beyond enduring, threatened a rebellion and forced the electric light to be banished from their peaceful midst.

Protecting Lead Pipes. — The *Revue Industrielle* says that the interior of a lead pipe can be covered with an incrustation of sulphide of lead by making a warm concentrated solution of sulphide of potash flow through it for ten or fifteen minutes. Pipes thus treated seem to be covered with grayish varnish, which prevents the water flowing through them from acting upon the lead.

Lightning-Rods again. — Mr. R. S. Brough has been discussing in the *Philosophical Magazine* the proper sectional areas of iron and copper lightning-rods. So far as mere conductivity is concerned, a comparatively thin wire of either metal would suffice for the loftiest conductor; but such a thin conductor would be dangerous, because it would be fused by a heavy discharge of lightning. Iron is more liable to be fused than copper; and the point Mr. Brough sought to determine was the relative sectional areas of rods of the two metals so that neither would be more liable to fuse than the other. Ordinarily it is stated that the iron rod should have four times the sectional area of the copper rod. Mr. Brough shows that these areas should be as 8 to 3; or, since the rods are circular, and circular areas are to each other as the square of their diameters, the diameters of iron and copper rods of equal effectiveness should be in the proportion of 1.63 to 1. Iron is therefore much the cheaper metal for lightning rods.

Another Proof of the Exactitude of Pausanias. — When the excavations at Olympia were first undertaken, the German Postmaster-General, Dr. Stephan, drew attention to a passage in Pausanias which mentioned a statue that had been erected in honor of a courier of Alexander the Great, and begged that special search might be made for it. News has reached Berlin lately from Olympia that the base of this statue had been found, with a well-preserved inscription which runs thus: "By the King Alexander's Runner and Traverser of Asia, Philonides, son of Totos, from Kretan Chersonesos, this was dedicated for the Olympian God."

Glue. — Carpenters should remember that fresh glue dries much more readily than that which has been once or twice melted. Dry glue steeped in cold water absorbs different quantities of water according to the quality of the glue, while the proportion of the water so absorbed may be used as a test of the quality of the glue. From careful experiments with dry glue immersed for twenty-four hours in water at sixty degrees Fahrenheit, and thereby transformed into a jelly, it was found that the finest ordinary glue, or that made from white bones, absorbs twelve times its weight of water in twenty-four hours; from dark bones, the glue absorbs nine times its weight of water; while the ordinary glue, made from animal refuse, absorbs but three to five times its weight of water. — *Building News*.

The American Architect and Building News.

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CONTENTS.

The net result of the twenty-eight days' tedious labor on the Chicago Custom-House trial, besides the discharge of all the defendants, has been simply to make clearer some things which seemed to be sufficiently clear at the outset. One is the unsatisfactory quality of the stone-work on the building, and its excessive cost; another the dangerous character of the original contracts, which enlisted the whole irresponsible force of stone-workers in a movement to fill the pockets of the contractor and to deplete those of the Government; another is the great difficulty, always recognized by lawyers, of proving an indictment for conspiracy; another, the extreme folly of the grand jury, which, having found out that the Government had been badly used, was apparently moved by blind wrath to lay its charges, without weighing the personal bearing of the evidence before it, in the idea that if it indicted all the principal persons who were concerned in the work, it must find among them some one who was responsible, or else that in so bad a job all the persons concerned must be banded together as a matter of course, and that if they were brought to trial the proof would take care of itself. Besides these unnecessary demonstrations there has resulted only the waste of a very large amount of time and money; the exceeding inconvenience and annoyance, perhaps the temporary discrediting, of some officials in whose honorable conduct there was from the beginning clear reason to have confidence, and of others against whom the charges have not been sustained. As to the main question at issue we see no reason to change the opinions which we expressed after the first consideration of them, or to dissent from the conclusions of Assistant Secretary French stated in his report on the subject, that there was no reason to believe in the complicity of the responsible officers of the Government; that the contractor Mueller found himself by virtue of the tender of his contract and by force of circumstances in a position where he had no need to commit himself to illegal acts, since all the interests of his workmen were engaged to increase his profits; that there was no need for any collusion but that of the timekeepers to produce a general tendency with which the superintendents were likely to find it hopeless to struggle, and against which the complicated machinery through which the Supervising Architect worked must prove inefficient.

That there should be some of the irritation of a disappointed chase among those who are sore on account of the abuses of this building is natural; but many of the comments which make themselves heard through the press strike us as wholly unreasonable. There is a disposition to attack the prosecuting officers for having "given away" the case. One Chicago paper exclaimed bitterly: "The verdict is that nobody was responsible — nobody was guilty; . . . . the only conclusion seems to be that it is no crime to swindle the Government." The verdict was simply that there was not reason to believe that the individuals indicted had conspired to defraud the Government. If anybody has evidence to show that one or more of these individuals defrauded the Government by other means than conspiracy, or that there was conspiracy among other persons than these, the way is still open to him. If it appears that the nation suffered by reason of an ill-judged system of administering work, which made it impossible for its officers to defend its interests adequately, and not from the dishonesty of these officers; here is on the whole reason for satisfaction rather than for wrath, and an opportunity to remember with some gratitude the officer who first protested against this system, and his successor who did his utmost to do away with it, both of whom were kept under the ban of this trial, till the court ordered them discharged without awaiting the verdict. One Chicago paper went so far as to charge the prosecuting officers with suppressing evidence which was at their disposal, and the Departments of the Treasury and of Public Justice with interfering to defeat the prosecution, a charge which possibly some other grand jury might be found to embody in an indictment for conspiracy between these two departments. That the departments, which had satisfied themselves by their own investigation that the government officers were not guilty, should have looked on their trial as a mere formality is natural enough; and that the prosecuting officers, who may be assumed to have known from the beginning the emptiness of the indictment, should not have pushed their case with all the zeal of those who had full faith in their cause, is not incredible. But to include those officers, and the administration of two departments headed by two members of the cabinet, in a general charge of conspiracy to defraud justice, is too much like the headlong proceeding of the grand jury, or the habits of political warfare, to command much general attention.

We cited some months ago (*American Architect*, September 7, 1878) the decision of a Pennsylvania court upon an architect's claim for lien. The decision was that in that case the architect could not recover under the law of Pennsylvania, inasmuch as he had not, in the language of the statute, "performed work about the erection and construction of the building." He had made plans and specifications for the building, but had never seen it, and therefore, it was held, had not performed work "about its construction" any more than had the clerk who copied the specification; whereas in another case cited in illustration by the court, the architect, who had superintended his building, did thereby perform labor about its construction, and was consequently entitled to a lien. We have now before us the decision of the New York Court of Appeals in the case of Stryker *vs.* Cassidy, which covers substantially the same ground as the Pennsylvania case. This case is one which, having been decided by the general term against the architect, came up on appeal. The first decision was reversed, and the right of the architect to a lien under the New York statute affirmed. The court, quoting the language of the statute, which allows a lien to "any person who shall perform any labor or furnish any materials in building, altering, or repairing any houses, etc., by virtue of any contract with the owner," held that it includes all persons who perform labor in the construction and repair of a building, making no distinction between skilled and unskilled labor, or "between manual labor and the labor of one who supervises, directs, and applies the labor of others," so that the contractor who carried on the building, the mural painter who decorates it, and the architect who superintends it, have the same right to a lien as the men who lay the bricks.

It is to be noticed that in this ruling the court takes no account of the distinction between the architect's two functions of designer and superintendent, upon which the Pennsylvania court based its discrimination of its two cases; and that its language, so far as it bears on that distinction, is not altogether clear, probably because the distinction was not in the mind of the judges. This is to be regretted, because it ought to be generally recognized and kept in mind that the two functions are distinct in kind, and there is no better way of keeping it in mind than by recording it in the decisions of the courts. If architects are to possess and use the right of lien it seems to suit with the general intent and spirit of lien laws to connect this with their service as superintendents rather than as designers, according to the Pennsylvania decision; and apart from its bearing on the question of lien, in a country where, as in ours, the differences between the duties and the professional attitudes of the architect and the builder are not as well understood as they should be, any distinction which emphasizes the separation between those of an architect's services which can be duly performed by a builder and those which cannot, should be encouraged. We have

before given an opinion as to the value to architects of a right of lien, a right which few architects will care to enforce if it is conceded to them. We do not insist on its hostility to the dignity of the profession, though that is not unimportant; but we have given two reasons, which we may briefly repeat, why we think architects do well to let liens alone. If it were their habit to enforce them, it would certainly tend to destroy the confidential character of their relation to their employers, which is the essence of their professional connection, and to make it a purely commercial relation. It would also tend in its degree to obliterate that distinction between the architect and the mechanic to which we have just referred, and which it is for the interest of them both, as well as of their common client, to maintain.

The coroner's verdict on the fall of Post & Co.'s building in Cincinnati, by which, as we mentioned last week, half a dozen men were killed, is that the loss of life was due to sending the men into the building after the fire, before there had been any inspection of it by a competent person, and that in this the insurance companies, by their adjuster, Mr. Covington, were chiefly "instrumental," a finding to which probably no great exception will be taken. To whom the technical responsibility for the loss of life belongs is not, however, of much consequence, unless it becomes a question of punishment, — whether it be Mr. Covington, or Mr. Cotteral, who examined the building, and who, we notice, is called an architect before the coroner's jury when his opinion is quoted as justification, but at other times a builder. The probability is, not that these gentlemen were more incompetent than their fellows, but that a majority of insurance adjusters or builders would have given the same opinion, being alike incompetent. The trouble lay in putting upon men of such occupations a responsibility which did not belong to them. Examination of the testimony before the coroner leaves it very doubtful whether the building was not overloaded before it was injured by the fire. This is a question which does not seem to have been carefully considered, but which might probably be answered with reasonable certainty even now by a careful and capable examination of the ruins. It would be a good thing if Cincinnati — and other cities — would profit by this experience, and provide for the inspection of their warehouses, before they burn as well as after, by inspectors who are specially trained to the work, and do not share the popular notion that a building may be expected to stand unless it shows visible signs of falling.

Various late movements in different parts of the country show the course of the labor war. The adoption of the new constitution in California has been accepted by the labor-reformers as a triumph of Kearney and his fellows, and in meetings held in several cities they have offered him their public congratulations. A resolution has been generally and enthusiastically adopted, to make a universal declaration throughout the United States, on the fourth of July, that eight hours is the proper day's work for a laboring man, with the expectation that in some way the declaration will work a corresponding reform; but without, so far as we know, any preparation for enforcing it. The bricklayers of Chicago, having set on foot the investigation of the stone-work of the Chicago City Hall, of which we have already spoken, followed it with a meeting in which they pronounced severe condemnation on Messrs. McNeil & Son, the contractors for the masonry of the City Hall, for their action in importing other bricklayers into the city when the resident workmen demanded higher wages. The meeting appears to have been captured by professional agitators, as workingmen's demonstrations are apt to be captured, especially at the West, and made occasion for airing the common theories of the socialists and of the devotees of fiat money. This unlucky tendency makes it difficult to judge of the real aspirations of the mass of working people in the country, and indeed everywhere, it not being easy to distinguish between their readiness to accept, for the sake of their own struggle against capital, any allies that offer, and their real interest in the political doctrines of their advisers. We are probably justified in believing that the working-men care mainly about hours of work and rates of wages, and comparatively little for communistic and financial theories, but the success of Kearney is none the less a warning. At the time when we write the spinners of Fall River, Mass., have ordered a general strike for higher wages, a movement which will be met by the mill-owners with a stoppage of all the mills, throwing, it is said, fifteen thousand work-people at once out of employment.

This strike at Fall River has its special point of interest, because, as in the great strike among the Durham miners in England, which has lately ended by the yielding of the men, arbitration had been proposed by the men and rejected by the masters. When such a rejection occurs it arouses sympathy for those who proposed arbitration and disappoints many persons who have come to look upon it as the panacea for labor disputes, or for all disputes. But this, it seems to us, is an exaggerated view of arbitration, which is certainly better than destructive war, and a very valuable resource when it can be availed of, but not a cure-all. While it is a natural resort when there is doubt as to the result of a quarrel, or to a person who recognizes the possibility of accepting another adjustment than that which he proposes, and is the refuge of the despairing, it is necessarily of the nature of a compromise, and therefore where compromise is impossible arbitration is inapplicable. No man, for instance, would submit his life to arbitration if he had any power to protect it. The would-be murderer could survive an arbitration if it went against him, but the victim could not. The builder or the manufacturer may know that he really cannot go on with an increase of wages, and in such a condition it is idle for him to submit his case to an arbitrator. This points to a reason why arbitration should commend itself most to the workman, — that he can always at need afford to yield something. To him the question of wages is a question of degree, and if he cannot have what he wants it is better for him to take what he can get than to stop work. With the employer, on the other hand, it very soon comes to a point where if he cannot have what he wants he must absolutely stop. There is, also, better opportunity for an arbitrator to do justice to the claims of workmen, because the conditions of the men's living and working are pretty uniform, and easily understood, while the conditions by which the employer's business is regulated are complicated, varying suddenly with individual cases, and of a kind which it is not easy, and often not desirable, to explain fully to an outside person. It is well, therefore, to accept the natural limitations of arbitration, and, while accounting it one valuable means of settling difficulties, not to look upon it as the solvent of all disputes, or be depressed when cases occur in which it is found inapplicable.

A correspondent whose letter, inasmuch as it is anonymous, we cannot print, writes to complain of the way in which some of the competition drawings for the Union League Club-House have been reproduced in our paper, saying that the plans are printed on so small a scale as to lose some of the detail, and make the lettering difficult to read. We should have been glad to illustrate still more fully and clearly than we have done the designs for this very interesting competition; but there are difficulties in the way. The designs, being for a large and complicated building, naturally required a good many drawings to exhibit them completely; to give any fair showing of them we must reproduce the most of these drawings, and they must be grouped together, each design in a single number, in such juxtaposition as to allow of easy comparison, for a clear understanding of their intention. We are not able naturally to devote all our illustrated pages to these drawings; it therefore becomes necessary to group them as closely as reasonable clearness will allow, for the sake as well of compactness as of exhibiting their relation to each other. Moreover, there are two other points which we will here ask our readers to remember, the more that they concern not these drawings only but many others. First, the drawings are prepared, not for our pages, but for general exhibition. Hence there are passages in some of them, — washes laid on with brush, and detail put in with pale ink, — which are not suited for our reproduction, and are necessarily lost or badly rendered in printing. Messrs. McKim Mead & Bigelow's design, we are sorry to say, suffered from this cause, as others have before. Second, the natural imperfection of human art is not confined to reproduction, but extends to drawings themselves. Therefore it is not safe to infer without knowledge that all which appears undefined or imperfect or crowded in the reproduction is clear and perfect in the drawing.

THE HYPÆTHRAL QUESTION.[1] I.

It is not positively known in what manner the temples of the Greeks were lighted. The ruined remains of their walls show no window-like openings intended for this purpose, and no Greek writer bears testimony upon the subject. Modern understanding of Hellenic architecture is at best so partial, and too frequently so per-

[1] Papers of the Harvard Art Club. No. 1.

verted, that the opinions held by architects and archæologists are often at variance, even when relating to subjects upon which indubitable facts throw direct light. It may be imagined, then, how discordant the views are concerning a matter in regard to which neither architectural remains nor literary documents afford decisive evidence.

It is commonly assumed that the interior of Greek temples was illuminated by the sunlight. With this as an axiom, it has naturally come to be generally believed that light was introduced to the naos from above, through an opening in the roof and in the ceiling. The plausible argument which leads to this result is in itself faultlessly conducted. We know that light was not admitted through the enclosing walls; it is no less certain that rays sufficient for the illumination of the interior of a large temple could not have found their way through the door, shaded as this was by the pteroma and generally also by a pronaos. How then, it is concluded, could sufficient light have been procured otherwise than through some opening in the roof? If the premise is accepted the result cannot be evaded. The learned Dr. Ludwig Ross, the only writer who has attacked the prevalent theory of an hypæthron,[1] while denying the existence of an orifice in the roof did, indeed, suppose that the light which would fall through the opened door would be sufficient to illuminate the naos, but did not succeed in establishing his theory, as the arguments of his opponents are, in this respect at least, convincing and conclusive. A repetition of those which prove the insufficiency of the rays which could reach the interior, even with fully opened doors and on a bright and sunny day, is here unnecessary; one needs but to refer to the exhaustive arguments of Bötticher in his monograph on this subject.[2] Moreover, there are passages of the ancient writers, notably several in the tragedies of Euripides, which show that temples were sometimes used with closed doors. Indeed, to have kept the doors wide open during all the services within would have exposed the naos, both really and ideally, but little less than would have been the case with an incomplete roof. In fact, there are many reasons to prevent the adoption of such an expedient which coincide with the practical and æsthetical considerations which will be urged against the hypæthral opening.

I believe all the light in the interior of larger Greek temples to have been artificial, and will endeavor to give reasons for this opinion, not omitting to consider any argument or testimony in favor of the hypæthron upon which weight has been laid by its advocates.

The hinge upon which the entire matter has turned is a notoriously obscure passage in the work of a Roman author. At the close of the first chapter of his third book, Vitruvius, after having divided temples into certain classes, according to their exterior forms, says: "*Hypæthros vero decastylos est in pronao et postico; reliqua omnia eadem habet quæ dipteros, sed interiore parte columnas in altitudine duplices, remotas a parietibus ad circuitionem, ut porticus peristyliorum. Medium autem sub divo est sine tecto, aditusque valvarum ex utraque parte in pronao et postico. Hujus autem exemplar Romæ non est, sed Athenis octastylos et in templo Jovis Olympii.*" This is the basis of the entire theory, and it should be remarked as being the only passage in any ancient writer that seems directly to call in question the existence of a complete roof over the naos. It is testimony of an author who wrote more than four centuries after the decline of Greek architecture, who evidently had never been in Greece, and whose remarks are often utterly at variance with the spirit and methods of the great Hellenic architects from whose treatises he compiled this part of his handbook. So far is he removed from a true understanding of Greek architecture, so little sense has he for the characteristic beauties of antique art, that it has been possible to argue, with no little force, that Vitruvius not only did not write during the reign of Augustus, as is generally assumed, but, on the contrary, that he did not live in antiquity at all, but was a monkish compiler of the Middle Ages.[3] Every editor has some emendation to the passage quoted. Some of them suppose that the examples referred to were the Parthenon, or some other octostyle temple in Athens, and the temple of Olympian Zeus in that city, or the temple at Olympia. It has been questioned, indeed, whether more than one temple was designated, and the genuineness of the "*et*" was doubted by Philander. But there was no octostyle temple in Athens dedicated to Zeus, and the "*et*" has been retained in recent editions. If the Parthenon and the temple of Zeus at Olympia are those referred to, which may be considered probable, then the latter, as well as the former, fails to correspond with the description, as it was not decastyle, but had six columns on its front. And further, if the words of Vitruvius are taken literally we are forced to conclude that the hypæthron was not used in Doric buildings, save in the two exceptional cases especially mentioned, because there were no Doric temples with ten columns upon the front, and with a dipteral arrangement of plan. It is well worthy of remark that Vitruvius declares that there was no hypæthral temple in Rome at the time of Augustus; for there, and at that time, if ever or in any place, this feature might be supposed to exist, because of the great number and variety of the temples of that city, as well as because of the far more probable adoption of such an arrangement by Roman than by Greek architects.

Dr. Ross, in his treatise, supposes Vitruvius to refer to those numerous temples in Greece which remained for generations uncompleted and unroofed, and gives many reasons for this belief. The Parthenon was finished centuries before Vitruvius wrote, but there was another octostyle temple in Athens, — the so-called Pythion, to which he may have referred, of which no more than the fact of its existence is known. The Athenian temple of Olympian Zeus happens to have been without a roof in the time of Augustus, though it had been commenced long previously. The supposition of Ross is thus possible. But it seems more probable that some curious error has slipped into the text-book of the illiterate Roman master-builder; or that some passage in a Greek original may have been wrongly comprehended. The authors whose works were before him may, somewhat as Ross supposes Vitruvius himself to have done, have made mention of those numerous temples which, from their great extent and cost, from political disturbances, or from other reasons, remained for centuries unroofed, unfinished, or dismantled.[4] And thus some reference to this fact, wrongly or only partially translated, may be responsible for the short paragraph at the end of the chapter which has caused such confusion and vexation to modern archæologists. This is naturally no more than a supposition, but it gains weight from the use of the technical term *hypæthros* by Vitruvius, which, though Greek and showing that he worked from a Greek originial, yet could hardly in that language be applied to a mere orifice in the roof, as it means, literally, without any covering whatever; ἐν ὑπαίθρῳ for instance, being used by Xenophon for the open air, τὰ ὑπαίθρα by Polybius for the open country. Only once is the word, to my knowledge, applied to buildings themselves. This is in a passage where Strabo uses it when speaking of the Artemision, *after the roof had been entirely burnt off*.[5]

As a parallel to the misunderstanding, one may suppose a mediæval chronicler to have recorded it as a fact that some cathedrals had but one tower surmounted by a spire and carried up to its full height, while the other was roofed off at a lower level. There were even more such unfinished churches in the Middle Ages, than unroofed Greek temples in antiquity. Yet, though it happens, in this case, to be sufficiently well known that the cathedral was then incomplete, this very incompleteness was copied in good faith in a building which formerly graced Union Square, New York.

If Vitruvius had indeed intended to designate a new class of temples, it is strange and exceptional that he gives no instructions in regard to executing the changes which would have been necessitated by the introduction of so unusual a feature. When to this it is added, that there was no hypæthral temple among the well-preserved buildings of Rome, that there were no dipteral Doric or Ionic temples in Greece, that Vitruvius was speaking of things he had never seen, and that the sentence was transcribed by compilers absolutely ignorant of antique building, the possibility of mistake is evident. And, as before said, testimony given by Vitruvius, in general, concerning Greek architecture, has but little scientific value and must be read with every allowance. If all his statements were to be taken as literally as these disputed lines have been, some very ludicrous and contradictory views might be based upon them.

It is not to be forgotten that this is the only passage in all literature of an earlier date than the last century which can be taken as authority for an opening in the roof, or for the supposition that Greek temples were directly lighted by the sun. Two other passages have, indeed, in the dearth of other assistance, been quoted by the advocates of an hypæthral opening, as showing its existence. Pausanias relates a story that had attached itself to a mark made by lightning within the enclosure of the temple of Olympia.[6] Phidias, on having completed his great chryselephantine statue of Zeus, and placed it within the fane, prayed for its divine acceptance and for a sign a thunderbolt was sent by the deity, which left this mark upon the floor near the statue. And, again, Apollo is said by Justin to have, on occasion, miraculously descended into his fane at Delphi.[7] To allow these two visitors to pass into the Olympian and Delphian temples, it has been urged that these buildings must have had openings in their roofs. But the tradition of the former appearance of a divine sign, or even of the apparition of the worshipped deity himself within his sanctuary, is not exactly architectural testimony, and does not necessarily prove that the ceiling was incompletely closed. The custom often observed by the Greeks, of erecting a fane over a spot which they considered sanctified by a stroke of lightning, may account for the presence of such a mark in the Olympian temple, if it there existed; while the centuries which elapsed between the ages of Phidias and of Pausanias render it possible that the legend may have arisen during the interim. Such legends were numberless; the mark of the thunderbolt may be compared to the cavity in the earth which was shown the same author in the temple of Zeus at Athens, through which it was affirmed that the waters of the deluge had retired. Yet no geological theory has been founded upon that cavity, and it is surely unjust that the history of architecture should have the exclusive advantages of such testimony. Such miracles do not need, and should not receive, any materialistic explanation. Strictly speaking,

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[1] *Keine Hypaethraltempel mehr, in Hellenika, Archiv archäologischer, philologischer, historischer und epigraphischer Abhandlungen.* Band I. 1. Halle, 1846.

[2] *Der Hypaethraltempel des Alterthums auf Grund des vitruvischen Zeugnisses gegen Prof. Dr. L. Ross erwiesen.* Potsdam, 1847.

[3] *Untersuchung über das Zeitalter des römischen Kriegsbaumeisters M. Vitruvius Pollio.* Chr. L. T. Schultz, 1856.

[4] Such temples were common in Greece: in the first two books of Pausanias alone, no less than seven are spoken of (i. 1, i. 40, i. 44, ii. 7, ii. 15, ii. 24, ii. 34).

[5] *Strabo*, xiv. 1.

[6] *Paus.* v. 11.

[7] *Just. Hist.* xxiv. 8. The words of Justin are "advenisse deum clamant (*sc.* vates) eumque se vidisse desilientem in templum *per culminis aperta fastigia*" It is more natural to suppose that the roof seemed to open to admit the god, than that it stood always open.

equal weight and belief may be allowed to each of these statements, and to the affirmation of the hypæthral opening itself.

J. T. Clarke.

BUILDING CONSTRUCTION.[1]

There is a kind of professional knowledge which it is generally assumed cannot be learned in schools, but must be acquired by frequenting offices, questioning workmen, reading circulars, private experiment, and conversation with one's brother students, followed by a long process of digesting the mass of information and misinformation so acquired, rejecting as far as may be the errors which are likely to form a large part, and arranging the remainder in some kind of order in the mind. From a part, at least, of this labor, it seems as if the student might be relieved by the help of books which should give him the benefit of the mature experience of those who have by the labor of years gathered knowledge, which when properly sifted needs but a few days to impart; but such books are rare, and the best of them leave much to be desired.

One of the most careful, the most scientific, and best arranged works of the kind is found in the Notes on Building Construction, of which Part III., treating of materials, is now before us. Some idea of the labor of collecting such information may be had from the fact that the author refers to ninety-two text-books as having been used in the preparation of the book, besides, as he says, "professional papers relating to engineering, building, etc., circulars and catalogues of manufacturers and merchants, and information given by scientific and professional men, quarry-owners, friends, and others," and it must be said that he has done the work well, the arrangement being clear and the facts presented with careful regard to the selection of the most important, and with the valuable addition of references which give the authority for statements which might be questioned. For instance, in speaking of zinc as a material for roofing, a line says that an objection to its use for such a purpose is that "it catches fire at a red heat, and blazes furiously." Probably few of us ever saw a zinc roof on fire; but any architect may be called upon to use the material for a railway shed or something of the kind, and its inflammability in such a situation is important, and we are glad of the reference to "Bloxam," through which we can investigate further in case of need.

Another good point of the book is its "modernness" of information. In it is the first practical account that we have seen of the way in which the Barff process of coating iron with magnetic oxide is carried on at a commercial scale. The little paragraphs in the daily papers are valueless compared with an authentic description like this. The still more recent process, in which heated air is used instead of steam, is referred to as being "in the experimental stage." There are, perhaps, some omissions, as in the case of the so-called "autogenic soldering," by means of the oxy-hydrogen blowpipe, which is not mentioned, although the process seems now to be sufficiently established to be worthy of a description.

Some very useful descriptions of the manner in which stones lie in the quarry, and the modes of testing stones, are given, which could have been learned only by visiting the quarries and questioning the workmen; and tables showing the qualities of the stone from all the principal quarries of Great Britain and Ireland are given, which must be invaluable to architects who use the stone from them.

Under Terra-Cotta a great deal of information is given which is particularly new and interesting; the connected subjects of the manufacture of earthen-ware pipes, roofing and paving tiles, and bricks of all kinds, are very fully treated of, and the reader is put on his guard against the tricks of dishonest makers. Under the general head of Limes, Cements, etc., there is much that is new, and more that is interesting though not new. In speaking of the mixing of mortar, the author gives very nearly the same description of the proper method as General Gillmore, and yet this method, so far as our experience goes, is never used among builders here, — of whom the good ones practise a more costly and laborious process than that recommended by the men of science. Both Gillmore's work and the book before us direct that the lime should be placed in the bed, and distributed evenly with a shovel, then water, in amount equal to two and a half or three times the bulk of the lime, poured over it all at once. Then the seething mass is to be covered up, either with a canvas, as General Gillmore proposes, or, as both books say, by throwing sand over it, two or three inches deep, and left to itself till the slaking is complete. In this way it is said that the steam is confined, and the lumps of lime heat and fall to powder better than when, as is the usual practice, a hose is turned on and two men rake and stir the lumps about, chilling them by contact with the cold incoming water, and in most cases getting the quantity of water much too large. With the very rich Thomaston or Rockland lime generally used here, there seems to be no reason why the scientific system should not be the common one, but we have ourselves never been able to muster courage to order it to be adopted.

There is much material for thought in the common processes of mortar-making and plastering, and some room for improvement. We once, with the consent of a builder of inquiring mind, tried the experiment generally recommended in the books, of slaking some lime for plastering two weeks before mixing with the sand. At the end of the two weeks the mass, soft at first, had attained the consistency of cream cheese, so that the labor of mixing the sand with it was greater than in the ordinary mode, where the sand is put directly into the hot lime, but the mortar was beautifully smooth and "fat," and made excellent work. In distinction from the scientific processes, we have heard of an ingenious mason in New Jersey who made his plastering mortar in what may be called the "natural" method, which consisted in emptying a barrel of lime on the grass, with a sufficient dose of water, and when the slaking was complete, hoeing up lime, grass, and dirt into a mixture of suitable consistency to be spread on the wall. The grass took the place of hair, the loam answered for sand, and the mortar stayed long enough on the wall for the mason to get his pay. Between these two extremes there are many varieties of work, and the young architect who finds plastering and mortar the most difficult portions of building work to superintend with certainty, will find many useful hints in this book. One simple test for ascertaining whether plastering mortar contains sufficient hair is given as follows: "If there is sufficient hair in coarse stuff (first coat) for ceilings, it should, when taken up on a slate or trowel, hang down from the edges without dropping off."

Some interesting information is given in regard to the celebrated "selenitic mortar," and tests are given which will be new to American readers. It certainly seems strange that when the addition of three pints of plaster of Paris to each bushel of lime will make a mortar which with five or six parts sand is much stronger than Portland cement with the same proportion of sand, it should have been used in this country, so far as we know, only in a part of one building.

Another material which we import and use to some extent, and would use much more extensively if the cost were not so great, is Keene's cement, or the Parian cement, which is quite similar. The receipt given in the book is to soak, in a solution of one pound of alum dissolved in a gallon of water, eighty-four pounds of calcined plaster of Paris in small lumps; the lumps to be exposed eight days to the air, and recalcined at a red heat. This process ought not to be very expensive, and the cement is admirable for base mouldings, architraves, etc., in fire-proof buildings, and for giving a polished non-absorbent surface to walls of school-houses and hospitals. The patent selenitic clay, for which no formula is given, is said to have similar properties, at still less cost.

The chapter on Iron and Steel is interesting to the scientific man, as well as the practical architect or engineer, concerned chiefly with modes of testing materials delivered, and of determining with certainty what kinds of metal will answer his purpose, so that he can specify with economy and efficiency the brands of iron that he wishes to use. Some of the tables of tests quoted from Mr. Kirkaldy, in which the area of the fracture is given, as well as the breaking stress, throw much light on the importance of considering both these characteristics in judging of the quality of wrought-iron. One of Mr. Kirkaldy's tables gives some facts which will be new to most readers. According to this, bars of chisel cast-steel, highly heated and cooled *in oil*, showed an average breaking weight of ninety-six tons per square inch, while the same bars heated and cooled in water broke under a strain of forty tons per square inch. With less heat the difference was not so great, but is still surprising, and perhaps is connected with the well-known property which oil has of toughening glass under similar treatment.

A useful table is that giving the thicknesses of ordinary lead pipes, and the pressures to which each class may be safely subjected. The weights seem rather light for practice, but margin enough can easily be allowed for effects of water-hammer; and in the case of heads up to four hundred or five hundred feet the table would save either tedious calculation or hazardous guessing.

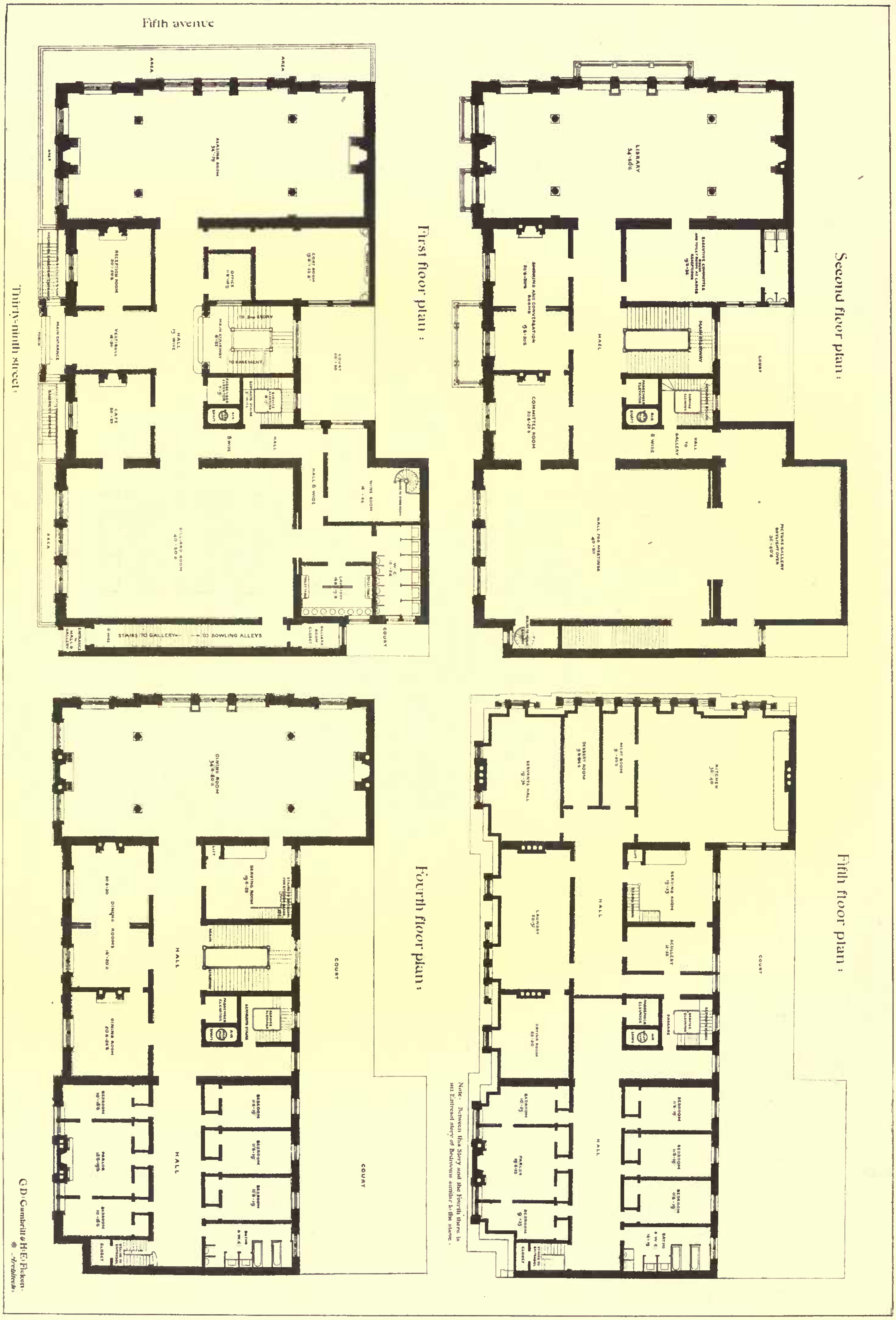
Another table, quite characteristic of the sensible and straightforward usefulness of the book, is found under the head of Paints, giving the number of pounds of white lead, oil, turpentine, and dryer required to cover one hundred square yards of "new wrought deal," both inside and outside, from one to four coats. Similar calculations are given for varnishes.

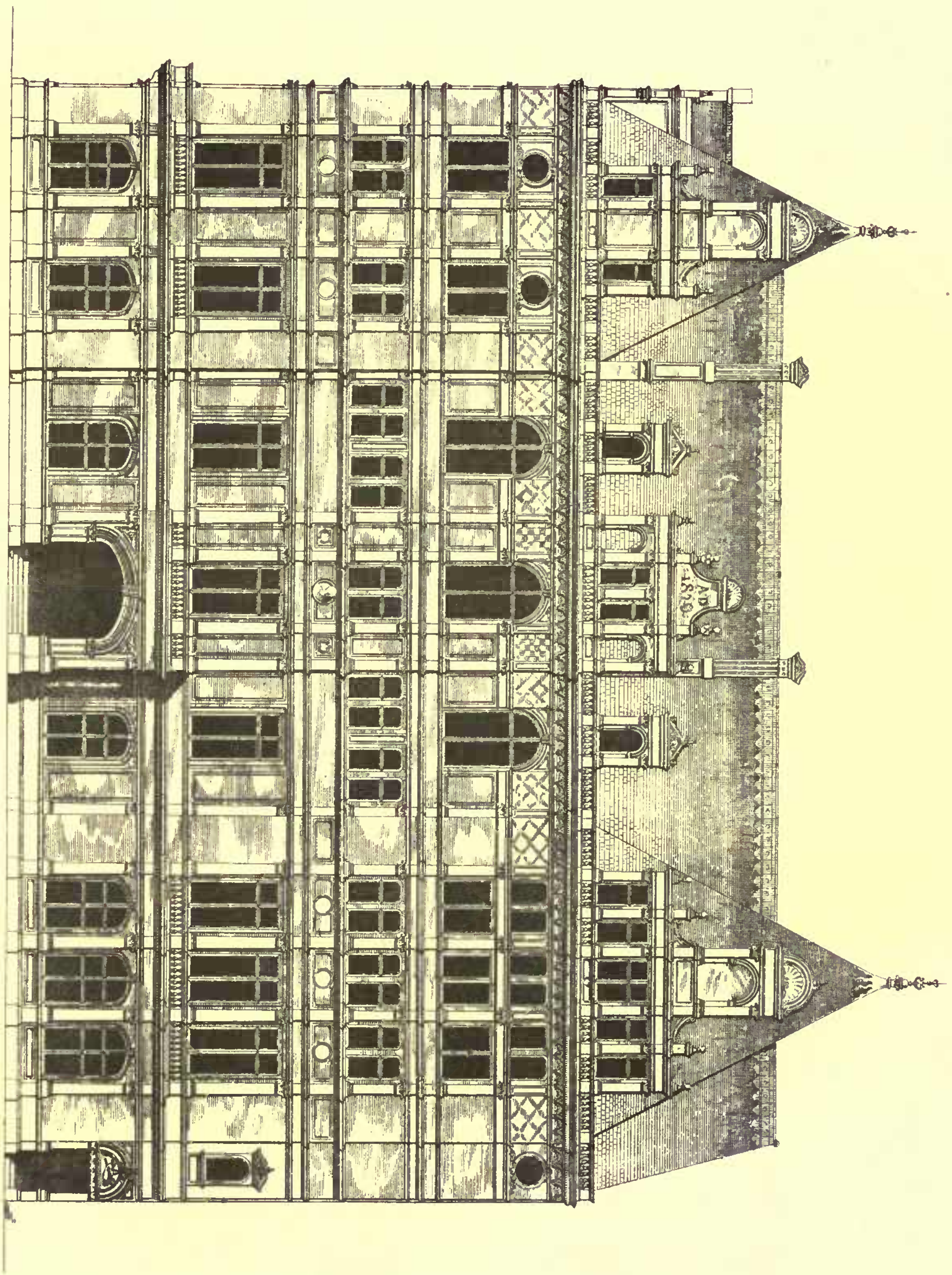
Throughout the book notes of the common adulterations of the various substances are given and the means of detection, and the whole has a truthful and scientific air very pleasant after the untrustworthy descriptions of circulars and the collections of doubtful recipes out of which most of us have to sift laboriously an approximation to accurate knowledge.

The only thing in the book which the reader will regret is that the tenacious conservatism of his public should have made it necessary for the writer to use English weights and measures instead of the metric system. In nothing does the absurdity of the English system appear more than in tables of strains given in tons, where some readers will be uncertain whether the old ton of 2,240 pounds is meant, or that of 2,000 pounds, unless it be formulas for mixing cements and concretes in which the quantities are given in bushels, and accompanied by a schedule of eight different kinds of bushels.

[1] *Notes on Building Construction. Part III. Materials.* Arranged to meet the requirements of the Syllabus of the Science and Art Department of the Committee of Council on Education, South Kensington. London, Oxford, and Cambridge: Rivingtons. 1879.

The Australian Exhibition. — The next world's fair, which is to be held at Melbourne, the capital of the province of Victoria, will open October 1, 1880, and close March 31, 1881. The buildings, which will cost out $500,000, are to be supplied by the government.

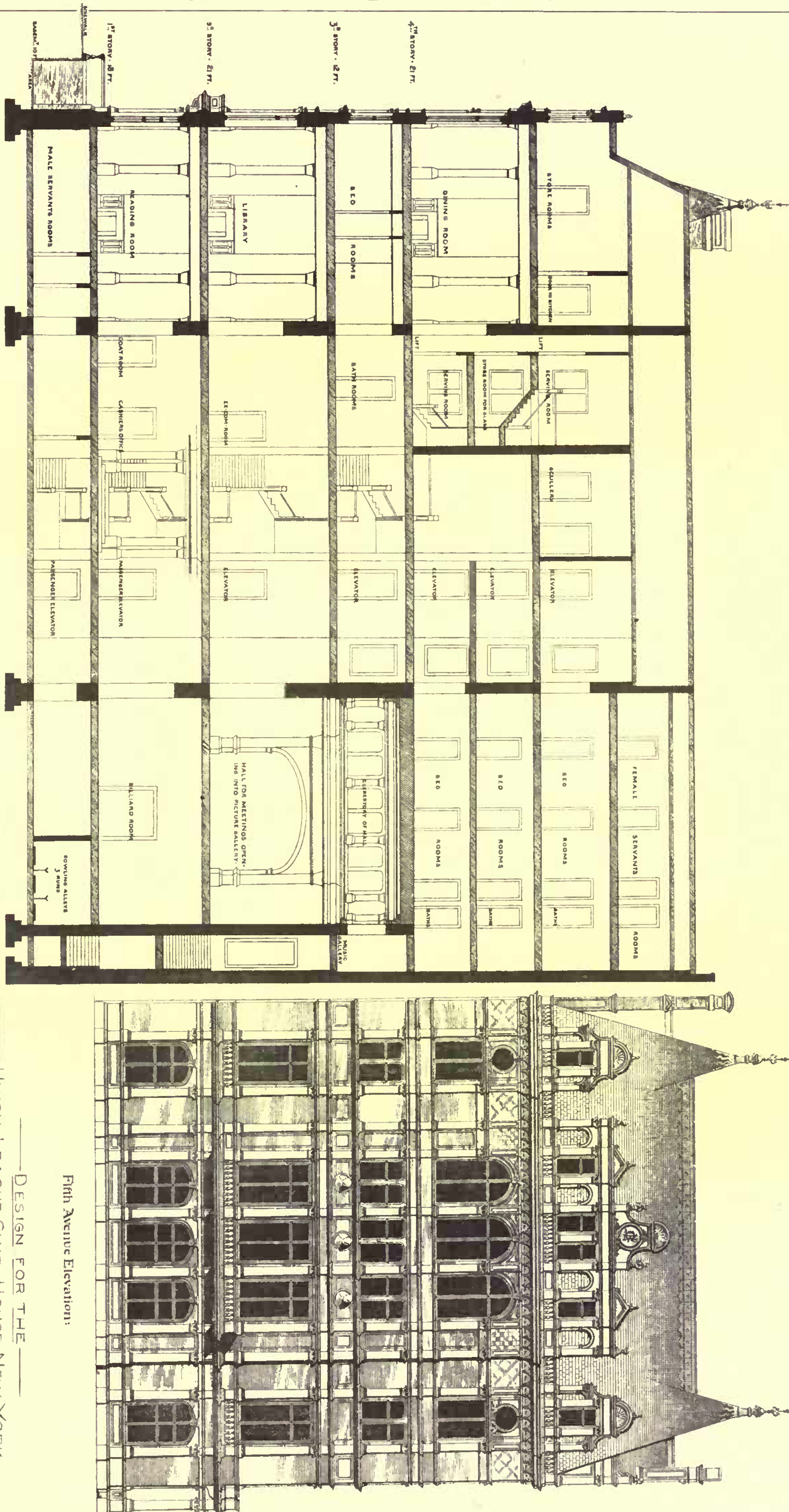

Fifth avenue
Thirty-ninth street.
First floor plan:
Second floor plan:
Fourth floor plan:
Fifth floor plan:
DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK.
G. D. Gambrill & H. E. Ficken Architects.



Thirty-ninth Street Elevation.

DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK

C. D. Gambrill & H. E. Ficken. Architects.



Skeleton longitudinal section thro' Hall:

G. D. Gambrill & H. E. Ficken. Architects.

Fifth Avenue Elevation:

Design for the Union League Club-House New York

The Heliotype Printing Co. 220 Devonshire St Boston

THE ILLUSTRATIONS.

COMPETITIVE DESIGN FOR THE UNION LEAGUE CLUB-HOUSE, NEW YORK, N. Y. MESSRS. GAMBRILL & FICKEN, ARCHITECTS, NEW YORK.

LAFAYETTE SQUARE PRESBYTERIAN CHURCH, BALTIMORE, MD. MESSRS. DIXON & CARSON, ARCHITECTS, BALTIMORE, MD.

THIS church is on an inside lot, that is, dwelling-houses occupy fully the lots on either side of it. It is built of stone and has a terra-cotta cresting.

CORRECTION. — We regret that a typographical error made us, in our last issue, give the name of the architect of the design for the Union League Club-House, reproduced with that number, as Mr. Ralet instead of Mr. Raht:

CORRESPONDENCE.

ARCHITECTURE AT THE ROYAL ACADEMY.

II. LONDON, May 28, 1879.

RESUMING our notice of the works at Burlington House, with the contributions of the youngest architectural associate, Mr. Waterhouse, we find him represented by three drawings, all in his familiar coloring, and, for the matter of that, in his own familiar phase of Gothic. No. 1094, the Interior of New Court, Carey Street, Lincoln's Inn; No. 1101, the Office of the Prudential Assurance Company, Holborn; and No. 1102, New Buildings at Pembroke College, Cambridge. The first two are remarkable as works in brick and terra-cotta, but they look hard and crude in many points, — not nearly such artistic buildings as they are drawings. In the latter sense New Court, with the fine group of trees in the centre of the court, is most charming. We do not think the Assurance Office one of Mr. Waterhouse's happiest efforts, so it is with all the more pleasure we turn to his work at Pembroke College, which, on the contrary, is one of the best bits of design he has lately done. It is also more English than most of his work, and so more appropriate than other things he has done, at both Oxford and Cambridge. The buildings, which seem to comprise a hall and some students' rooms, are in red brick with stone finish, and the hall is very good indeed, while another block with a tower farther off on the right might be anywhere but in a college quad. The drawing is again delightful. Mr. Waterhouse is thoroughly at home with his brush, and his designs lose nothing by their artistic rendering. No. 1095, House at Eastbourne, and No. 1132, House and Shop in New Bond Street, are by Mr. R. W. Edis. The former is a quiet, English-looking house in red brick. The entrance gable, with balcony on the right, shows some very good design, contrasting well with the gable to the stable yard. The Bond Street house is one of the best pieces of street architecture in the exhibition, and is shown in a very effective pen-and-ink drawing. It is in a free treatment of classic, very well detailed, with some excellent carving. The shop front is exceedingly well managed, and the house above rises with a lofty dormer towards the street. The red brick is set in bands across the front, as in another house by the same architect higher up the street, and produces a very good effect, while the curved bay-window running through two stories relieves the flatness of the front; it is altogether a very artistic piece of work. No. 1103, House in the Paris Exhibition, by Mr. G. R. Redgrave, an imitation of old half-timbered work, remarkable for nothing except to show how a good opportunity may be absolutely wasted. No. 1104, Interior of the Grand Staircase of the recently opened Shakespeare Memorial, Stratford, by Messrs. Dodgshun & Unsworth, is not nearly so good in design as the exterior: the flat arch through which the view is taken is particularly badly proportioned. No. 1108, Lansing College Chapel, by Messrs. Carpenter & Inglelow, is all vaulting and not very good at that; not by any means the quality of design we expect from Mr. R. H. Carpenter at least. No. 1112, Tower of St. Paul's Church, Manchester, by Mr. T. O. Scott: a very good tower indeed, much improved from the original design by the addition of the buttresses. It grows out well from the body of the church also. No. 1116, Sheperds Spring House, Hants, by Messrs. Dodgshun & Unsworth; a very fair study of brick and timber work, with a quaint entrance porch. No. 1117, Divinity Schools, Cambridge, by Mr. Basil Champneys, is a thoroughly artistic piece of work in late Gothic, very English and exceedingly well detailed. The drawing, which is in pen-and-ink, does not do the design full justice; it is much better in execution than the drawing makes us aware of; indeed it is one of the most satisfactory of modern works, and does its architect great credit; it has all the feeling of the university about it, vigorous and at the same time refined in treatment. The octagon turret at the side of the gable is particularly well managed, and the late character of the tracery in the windows is ably carried out with all the spirit of the old work.

While on the subject of collegiate work we may notice No. 1126, the Interior of the Chapel of St. David's College, Lampeter, by Mr. T. G. Jackson, a beautiful water-color drawing of a most delightful interior. The stalls, screen, and other wood-work are tinted a quiet sage green relieved with gold. If this is the color intended the effect must be truly delicious, nor is the architecture less successful than the color; it is a most careful study of late English Gothic quite like old work in detail and feeling, the production of a true artist. So again is Mr. Jackson's new quadrangle for Merton College, Oxford (No. 1164): though perhaps not so satisfactory as his examination schools for the same university, or so exquisite as the chapel first noticed, it is full of careful work, in the picturesque phase of classic with which his name is identified. The work proposed in the drawing seems so large as almost to amount to a reconstruction of Merton College. Looking at Mr. Jackson's two drawings, one is almost inclined to wish the new quad had more of the late Gothic and less of the nondescript classic, so much stronger does he seem to be in the former than in the latter. No. 1120, New Hospital for Consumption, Brompton, by Mr. T. H. Wyatt, is a huge red brick Queen Anne pile of no particular worth. No. 1125, another consumptive hospital design, this time shown in pen-and-ink, but to which the same remark applies, looks as if it had been designed by the yard, and has evidently heavily taxed the powers of its three designers, Messrs. Tasker, Batterbury, & Huxley. No. 1127, Potternewton Church, Leeds, by Mr. H. Walker, a good Early English interior. No. 1128, decoration of staircase at No. 1 Grosvenor Crescent — lower stages very blue, too much so; the upper stages, being greener, are much better, and the color is much superior to the ornament. No. 1134, interior of Dominican Church, Waterford, by Messrs. Goldie & Child, much in the same bad classic style as their design for the Oratory church before noticed. Messrs. Goldie & Child are much more successful in early Gothic than in this sort of thing, with which they are evidently not at all at home. No. 1138 is a pair of houses at Wandsworth, by Mr. T. E. Collcutt, in rather fussy Queen Anne. We ought to have noticed some rather nice gate-lodges, by Mr. Collcutt (No. 1093), and in 1176 he sends the interior of his house at the Paris Exhibition. We hear he had a very fine drawing of the council chamber of his New Town Hall at Wakefield rejected. Surely, somebody must have made another mistake here; probably we shall see it on the walls next year, and in a good place. For instance, why should it not have been in the place of No. 1144, design for a town hall, by William Scott, a poor design in a nondescript kind of Gothic, restless and fussy to the last degree, evidently the work of a novice in architecture? And yet it has the place of honor on one side of the gallery, clearly another mistake by somebody. Here is another case of the same, in No. 1145, so much wall space wasted on a heavy interior of designs for decorations and furniture of no earthly interest to any one but its author. There are several of these fancy interiors in the collection; the subject has been done much better a dozen times over, and they are mostly imitated from what has been seen before. After all they are only "designs," and the space they occupy would have been much more usefully taken up with representations of executed work which have been rejected, that is, if the display is supposed to represent the architecture of the year. In No. 1146 we have another of Mr. Walker's churches, Armley, Leeds, also very fair work; and in No. 1150, the Windsor and Eton Albert Institute, by Messrs. Bacon & Bell, a very ordinary Gothic structure. Passing over several decorative and other designs of more or less merit, we notice one of a portion of ceiling decoration at Longleah, by Messrs. Crace & Son (No. 1162). This is a noteworthy exception to the general run of the designs we have been speaking of. It comprises a series of figure subjects in panels, vigorously drawn and well colored, good both in tone and execution. No. 1161, design for Yarmouth Town Hall, by Mr. W. C. Brangwyn; a Gothic design of considerable merit, — by the way, the accepted design in this competition is not here. No. 1171, the Great Barn at Harmondsworth, an effective drawing of a most interesting piece of old work, by Mr. G. R. Webster. No. 1172, proposed tower for Mary's Church, Brighton, by Mr. William Emerson; a noble-looking tower, but with a rather long belfry stage. No. 1173, the selected design for the Consumptive Hospital, Hampstead; a château-looking building in a free treatment of classic, by Mr. T. Roger Smith. It ought to look very well on the picturesque site at Hampstead.

No. 1177, southwest view of Adcote, Shropshire; the diploma work deposited by Mr. R. Norman Shaw on his election as an Academician; the most beautiful pen-and-ink drawing in the room, as it is probably also the most thoroughly artistic design in the whole collection. Mr. Shaw has here returned to the late Gothic work of which he was the most accomplished exponent before he devoted himself to the revival of Queen Anne, and no work he could have chosen for the gallery of the academicians could better represent his powers as an artist than this. It is simply perfect; no eccentricities mar the quiet spirit of the work, truly English, picturesque without any forcing whatever; all seems to come quite naturally from the requirements of the plan. The contrast of light and shade, of form and feature, is admirable; it would be simply hypercritical to begin finding faults, rather let us be thankful the best traditions of English architecture have not died out of the land quite yet. No. 1178, façade for St. James's Church, Marylebone, by Mr. G. G. Scott; this is a design for a new front for the church of the well-known Mr. Hawis. As the reverend gentleman is very fond of music, we presume this accounts for the unusual array of fine belfries ranged along the front; but apart from this, the style, which is Italian, is carried out with considerable originality of treatment, and no small merit. No. 1182, the Bank at Colchester, Mr. E. C. Lee, a vigorous example of secular Gothic applied to business purposes, and shown in a very good pen-and-ink drawing. This is a very telling piece of work, carried out with great spirit, and excellently detailed.

The corbelling out of the first floor window, with the parapet and dormers above, are striking features; it is altogether very ably designed. We had almost overlooked No. 1163, Carlyle House, by Mr. A. Croft, a notable addition to the Queen Anne houses on the Chelsea embankment. The design is a very fair example of the now familiar style, and seems able to hold its own among the works of greater names.

There are several more or less creditable drawings of old work and other studies; but we have on the other hand no illustrations of several well-known works executed or in progress during the year. As we have said before, the space devoted to the "Mother of the Arts" is smaller than ever, part of that valuable space is taken up by drawings which should never have been there at all, and if all is true that we hear about the unusual number of rejections, surely some of them would more worthily have represented the architecture of the year, than numbers of the accepted, which represent next to nothing, and are not even interesting as drawings.

ARCHITECTURAL FOLIAGE.[1]

THE Romans carried out the enrichment of their mouldings with sculpture to a greater extent than the Greeks, and they also enriched their friezes with many fine arrangements of foliage associated with animal form. But besides these they enriched many of their plain surfaces with sculptured foliage, as in the architraves of their entablatures, as well as the coronas and soffits of their cornices. Showing also their increased partiality for foliage, they greatly developed and perfected the Corinthian capital, but not only that, they added foliage to the Ionic capital, producing what has been called the composite, and so considerably enhancing its beauty as an enriched capital. They panelled too some of their pilasters with grand and magnificent foliated scroll-work. But with the exception of these last, this decoration must have been placed at too great an elevation to have been properly seen. It was left, however, to the modern European to carry out these antique styles devoid of *all* enrichment or sculpture, except long lines of bare moulded form. He is the only artist who deliberately sits down and wastes his time over the contours of quirks and ogees, and by the aid of the plasterer's mould runs his entablatures, and borders all his windows and doors, with his surprising combinations of mouldings. His plain surfaces are relieved only by scratching upon them lines to indicate colossal blocks of stones.

I would, however, call your attention more particularly to the improper application of decorative sculpture. We have been told by one whose authority upon such points cannot be too highly valued, the late Mr. Owen Jones, as well as by Pugin and others, and I suppose we all acknowledge it to be true, that construction should be decorated, and that decoration should never be purposely constructed. Yet we constantly see buildings erected where the so-called decorations are added to or applied upon the architecture, as if the very opposite were the rule. Buildings, in many instances, have become overloaded by applied ornament, instead of its being formed naturally out of the construction. Festoons and swags of gigantic size are pinned up to the surface of the walls by pateras or lion heads, and tied there by impossible ribbons, while little window pediments are broken in the centre in order that their cornices may be piled up with immense loads of sculpture or foliage. In many modern French ceilings festoons of *papier mâché* are frequently introduced, actually hanging away from the ceiling, looped up by their extremities. Surely if enrichment is a portion of architecture, and an integral part of it, no greater violation could be imagined than thus to separate or hang it up, as if ready to fall upon the spectator's head. Unfortunately there is a precedent found in antique architecture for these applied forms. The Corinthian capital is not a composition which grows out of and forms a part of the column itself, like the grand old Egyptian capitals, but all the parts are applied or added outside the bell, which is the actual capital — a circumstance which, to say the least of it, has greatly aided the labors of the modern plaster-caster; but it is not composed upon such principles as should be the rule in architectural ornamentation.

It will be considered, no doubt, very fastidious and even presumptuous upon my part, thus to condemn a form of capital which has received the support of so many centuries. I am not, however, the first to point this out; the object, however, is not so much to find fault with the Corinthian capital, which doubtless will still continue to be admired, and be most faithfully copied for many generations to come, but to endeavor to point out the defect which, more or less, runs through Greek and Roman architecture. Although it may not be a very prominent fault in antique examples, yet it has given rise to most unfortunate results in modern times.

No period in modern English architecture is more justly noted for foliated carving than that belonging to the school of Sir Christopher Wren, at the head of which stood Grinling Gibbons. For skill in workmanship, dexterity of manipulation, and close imitation of nature, this period stands perhaps higher than any previous or later one. It is, however, to be regretted that so much of this remarkably beautiful carving should be afterwards applied and added to the construction which it is intended to enrich. Ornament, to be true, must be subservient to the purpose and to the architectural forms of the work itself. The features themselves should be enriched, and as a general rule ornament should be taken out of the material — sunk below the surface and not laid upon it. A work may be literally covered with ornament which will immeasurably aid the beauty of the architecture when used in its legitimate place, as in the walls of the Alhambra, or to take a more humble but not less striking example, in the elaborately carved but simple form of an Indian sandalwood box: it is enriched without anything being added to it, or altering its primitive form or construction.

The great defect of modern ornamentation is that it is so often represented as if it had weight in itself and that it was absolutely necessary to hang it up, or that it should stand upon its own base, as in many of the otherwise very beautiful Italian arabesque pilasters.

The festoon, as a means of ornamenting a work, has been used in French and Italian Renaissance more than any other form, but it is essentially a bad one, and it is at the same time one of the most objectionable forms of constructed ornament. From its very nature it is *added* to the thing ornamented; it often overlies architectural features, and is formed of an artificially constructed collection of miscellaneous flowers and fruit. Unhappily it appears to have been coming into fashion again of late. Its origin, there cannot be a doubt, was derived from the Roman altars, which were decorated in the earliest times with the actual heads of the animals which were sacrificed. These were placed at the angles of the altar, and festoons of flowers were looped up from the horns and tied with ribbons. They were afterwards carved upon the altars in stone or marble, and from them the same decoration was soon transferred to the friezes of the temples. It therefore became a precedent for architectural decoration, and has been used ever since in every conceivable position; in festooned bands round buildings; under windows and over windows; over doorways; over arches and between arches; between capitals or attached columns or pilasters; hung from eye to eye of voluted capitals and consoles, as well as on ceilings and on mosaic floors — in fact, there is scarcely any position in which the festoon has not been used. Again, festoons are not only made up of all manner of flowers and fruit, strung together without any cohesion of parts, but of nearly everything that can be imagined, such as musical instruments, books, dead birds, shell-fish, and a multitude of other objects, as well as the ever indispensable ribbon.

Grinling Gibbons appears never to have been able to get on without festoons, ribbons, and drops or pendants in his work. The example of a panel from St. Paul's Cathedral is a good specimen of this. It is executed in the usual manner that he adopted for nearly all his most important works: that is, it is carved in lime-tree and planted upon an oak panel. The composition is rich and bold, but somewhat confused, and at first sight the manner in which it is composed cannot be clearly distinguished. In the centre there are a pair of crossed trumpets tied together by a ribbon. Then there are in the upper part interlacing scrolls of a conventional type peculiar to Grinling Gibbons — for which in my opinion he deserves more credit than for any other part of his work, but to which I will refer presently. Out of the upper part of the scroll (I am now explaining one half of the panel) there drops a swag or festoon of small flowers, either periwinkles or primroses, which runs to the upper angle of the panel, and from which, hung to a single flower, drops perpendicularly a bunch of trilobed leaves, forming the end of the design. But besides this there is a larger and bolder swag, which is in much higher relief than any other part, extending from the knot of the ribbon at the junction of the trumpets, sweeping to the bottom of the panel, and going right up to the extreme angle again, from which the smaller festoon and drop hang. This is repeated in the other half of the design; all, except the scrolls, being supposed to be hung up by artificial means. A portion hangs from the scrolls, but how they and the angle flowers are supported does not appear.

The peculiarity of the scrolls which appears to be characteristic of Gibbons's work is that instead of the leafage forming a sheath, as in nearly all classical foliage, it grows out of the stem itself, or arises from the other side of the stem, as in the examples from St. Mary Abchurch. The leafage is from nature, taken evidently from the hawthorn, and in some cases from the celery-leaved crowfoot. In richer work, as at St. Paul's, the leaves are double: that is, one lapping over the other. A defect in these latter scrolls is that they grow in two directions: that is, out at both ends, which might have been easily avoided. Some of the best and richest of Gibbons's scroll work of this kind, of great excellence and beauty, is to be found in some richly ornamented and pierced oak doors in the library of Trinity College, Cambridge.

The fruit and flowers in the festoons are all accurately and very beautifully copied from nature; they consist of peonies, anemones, crocuses, primroses, tulips, peaches, peas, and other fruits. All are separate and disconnected, except occasionally by some faintly carved lines or strings at the back. No part is growing, but is in "still life;" the fruit or flowers are separately fastened in their places by means of screws, nails, and glue, and when in very high relief, they are not worked out of one solid piece of lime-tree, but are formed of different layers of wood, about two inches thick, placed one upon another. There is no undercutting, properly so called, as the whole is backed off behind, and shaped previously to its being planted on the ground, which gives the work as much relief as if it consisted of actual flowers. This is not the case with the oak scroll-work which I have

[1] Selections from a paper read before the Royal Institute of British Architects, by James K. Colling, F. R. I. B. A.

mentioned as that from St. Mary Abchurch, and the library of Trinity College, Cambridge, which is all carved out of the solid.

It will be perceived that the panel to which I have referred is made up in two different styles: the natural in the festoons, and the conventional, as seen in the scrolls. Now this manner of mixing up the natural and conventional is common to most of the foliated work of the Renaissance period. Natural ivy, vine, oak, and other leaves as well as fruit, are introduced occasionally among foliage which may be described as purely architectural, and in such an incongruous manner that they never properly amalgamate with the other portions of the composition. Gibbons went in boldly for nature in his own style, and whenever he adopted the natural he made the conventional quite subservient. But in the French and Italian the natural is usually introduced as if it were only an accessory. There were some exceptions, as in the border round Ghiberti's doors, which is entirely natural; but, as a rule, nature was introduced but timidly. There are many examples, however, even among Roman work, where natural foliage was thoughtfully and most artistically followed and worked out, as in the example from the stem of a fountain in white marble, found near Tivoli, but now in the British Museum. A spiral line is formed round the shaft or column by a serpent, and a branch of ivy grows up from below, filling up the spaces between the coils of the serpent in a very graceful manner. The natural flow of the leaves with their long foot-stalks and the bunches of berries are most faithfully and artistically rendered. Even the little buds in the axils of the leaves are introduced, showing with what minute attention they observed nature. The leaves, also, are plain and undivided, as they invariably are in nature, when found near the flower.

There are numerous other instances in Roman work, where nature has thus been studiously followed; more particularly in carvings from the vine, oak, and ivy. Now what I want to elucidate by this is, that as there have been artists, even in ancient times, who have made a close and successful application of nature to art, by entirely throwing over the conventional treatment of their times, we, in the present day, should, like the ancient Roman who sculptured that beautiful stem of a fountain, throw aside all architectural precedents for foliage, except the principles upon which he worked, and boldly make our applications directly from nature. But instead of doing so, we, like many of the Renaissance workers, who also strove to reintroduce nature, are so bound by conventional rule, that we are not likely, from this timid mode of proceeding, to succeed but in a partial degree, and by adopting two different manners we must fail in harmonizing them.

Artists and carvers are told by architects, and one hears it continually held up as law, that foliage for architectural purposes *must* be highly conventionalized, that it must not be too natural, and so on. I was in a church the other day, which had been lately restored, and I remarked to the clergyman, "Why, what commonplace designs all your new poppy-heads are." "Oh, yes," he replied, "our architect prefers them; the carver wanted to make some of them different, but the architect would not allow him to do so, but would insist upon his copying the old ones." In this manner, which is only too common a case, we are constantly trying to resuscitate the ornament of former ages. This plan will never lead to any good result, and will bring with it nothing but disappointment. For whether we essay to design in the style of the Greek, or the Roman, or the Gothic (for instance, as in the manner of the very beautiful foliage of the Early-English period), however much we may admire these works, they are all things of the past, and we never can by any mode of copying or adaptation make them applicable to the nineteenth century. There is therefore a paramount necessity for again having constant recourse to nature as the main element of the beautiful for architectural foliage.

SLOW-BURNING CONSTRUCTION.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — If you can spare a little more space for discussion of the subject of slow-burning construction, I would like to make a few comments on E. A.'s last letter, and hope that my reply may be half as interesting and instructive as his communication.

Before proceeding to practical matters, I wish to defend the profession from being considered responsible for school-house construction. How much the real architects have to do with such buildings may be inferred from a little story, to which I imagine there are many parallels. A member of the Institute once submitted designs in competition for a school-house in a certain city. He was afterwards told that his design was adopted, but for a long time heard nothing further. Being a gentleman, and unwilling to importune the committee, he waited until one day, passing the spot, he saw his school-house half built. He applied to the committee for an explanation, and was told that he was too expensive an architect for them, and they had found one who agreed to take his sketches and make the working drawings and specifications for forty dollars, and they had given him the job. I venture to say that it is the forty-dollar architects who have done the larger part of the school-house construction, and between them and the committees who employ them, the public gets all the safety and convenience that it need expect.

However, I am far from claiming that architects do all that they might in promoting good construction. Long habit, the opposition of builders, and the indifference of owners have induced careless ways which are much to be regretted; but I think that few of the respectable ones are unfamiliar with most of the precautions which E. A. mentions. At the same time there are many details about which they would be glad to learn from one who certainly shows himself well qualified to inform them. In the hope that he will be disposed to give us the benefit of his experience, I will make a few inquiries, rather than criticisms, about the mode of factory construction which he describes, with reference to its application to more finished buildings.

First, of the hollow walls. I suppose he would build hollow walls with brick ties, as by so doing he can get his air-space, and increased thickness of wall, with the use of very few more brick than would be needed in a solid wall of the same length and height. But in walls to be plastered, the brick ties are hardly admissible, as moisture is conducted across by them from the outside to the lining wall, and shows itself in the plaster, where that is put directly on the lining wall, without furring strips. The stains might not be important in school-houses, compared with the superior safety to the structure. I leave that for committees to decide. But in houses or public halls the risk of ruining expensive paper or decoration is very great. I have heard of brick-tied walls which were dry, but they must be rare exceptions. The usual way of meeting the difficulty is by using hoop-iron ties for connecting the wall and its lining. This is effectual, where well done, but expensive; as a lining so tied adds nothing to the stability of the outside wall, which must be of full dimensions without it, and the cost generally determines the use of the much cheaper furring and lath. If E. A., or any one else, knows of a way to keep with certainty a brick-tied hollow wall dry, he will confer a public benefit by describing it.

The floors and roof used in the factory construction are admirable. Three-inch plank, covering heavy girders, with inch flooring on top for a finish, present a solidity as pleasing to the practical man as the opportunity for picturesque interior effect is attractive to the artist, and to bring such construction into general use is worth a strong effort. It would not be cheap, for the casing, moulding, and decoration which would be essential to bring the rough girders and plank into a form satisfactory to the public eye would cost many times as much as the plaster which it superseded, and it would be difficult to insist on the necessary solidity. Where one inch of boarding above the beams was strong enough to bear the weight upon it, and gave the same opportunity for finish, it would be hard to induce the owner of a house to spend four or five hundred dollars more for mere dead-weight of lumber, and yet without this extra thickness the open construction would, I presume, be less safe than the ordinary plastered ceiling. In the Oak Bluffs cottages such a mode of building is universal, and the rate of insurance there is, I believe, one per cent per annum.

E. A. describes his partitions as consisting either of brick walls, or solid plank, plastered, or studding with wire-lath and plaster put on in such a way as to cut off the passage of fire, even on the studs to which the lath is fastened. Brick would be too expensive for houses, and plank partitions would transmit sound, and would buckle under the weight of the floors, unless very thick, or interrupted by posts, and I should be glad to know how the studding is protected against the passage of fire by the wire-lathing. Most architects bridge their partitions, thus cutting off the direct draught, and many lay from two to five courses of brick between the studs at each floor, and would be pleased to learn of any more efficient protection.

I am also desirous of further information as to the merits of wire-lathing. I have used it in plastering over hot-air pipes carried up in stud partitions and similar cases, but the protection it would afford to the studding itself would seem to be quite limited, while the cost is considerable. The combustion of the laths, nearly surrounded by plaster, would be slow, compared with that of the studding, and the advantages of the superior key which the wire lath gives can be secured in other ways at much less expense. At fifty cents per square yard for the wire, a stud partition lathed on both sides with it, would cost quite as much as the same partition built of hollow concrete blocks, and the latter would be absolutely fire-proof, while as the specifications say "the circulation of air and mice" would not necessarily be impeded by wire, any more than by wood lathing. Add to this the rapid corrosion of the wire, if the mortar should be for any reason gauged high enough with plaster of Paris to give it an acid reaction, and the indications seem to be in favor of looking to concrete for such purposes, rather than to iron in any form. But this is just the subject about which I wish to learn, not instruct, and I gladly yield my place in the discussion to others better able to continue it.

I am afraid that E. A. thinks it a little unreasonable for architects to be unwilling to send sketches of their ideas of what a mill should be, and a reference to Mr. Whiting's design, as E. A. describes it, may illustrate the difficulties in the way of one, however skilful in other branches, who attempts to construct *a priori* a plan of the kind. Few architects would dream that an acre of ground, to be used for a manufacture requiring, it would seem, abundant light, could best be covered by a structure 136 by 330 feet in plan. That such a building would be cheap, economical in heat and artificial light, would be plain enough, but to propose to put the operatives in the middle portion of the room at such a distance from any light and air but what could be obtained from skylights would, I should

say, put a man *hors de concours* at once before a professional tribunal. This is not by way of criticism on Mr. Whiting's plan,—of course he knew what he was about,—but simply to show how necessary it is for the best architects to expend much time in study of any subject not perfectly familiar to them before their sketches or suggestions would be of much value, and as most of them realize this, the response to such an invitation would be very feeble. C.

CHRIST CHURCH, GERMANTOWN, PA.

506 WALNUT STREET, PHILADELPHIA, June 16, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir,—Will you please correct the statement in your last issue, that Mr. H. R. Marshall, of New York, is the architect of Christ Church, Germantown. My design was unanimously adopted by the Vestry in the beginning of the winter, and has been under contract for several months. Yours faithfully,

JAMES P. SIMS.

PUBLICATIONS RECEIVED.

BEVIS'S BUILDERS' PRICE BOOK for Architects, Engineers, Surveyors, Builders, and Contractors, and Guide for Estimates. By Henry C. Bevis, Surveyor, etc. London: H. C. Bevis & Co. 1879.

NOTES AND CLIPPINGS.

As it is desirable to mail with the last number of a volume the index of that volume, our issue for next week will be somewhat delayed in its delivery, though probably not more than a day or two.

THE NEW YORK DEPARTMENT OF BUILDINGS.—The investigation which we mentioned some time ago as making into the conduct of Mr. Henry J. Dudley, Superintendent of Buildings in New York, appears to have been abandoned, because after several fruitless sessions had been held it was found that one of the signers of the affidavit which gave cause for the investigation was not a tax payer. As this was a violation of the charter the proceedings were quashed.

PUBLIC BUILDINGS.—Mr. Murch, in behalf of the Committee on Public Buildings and Grounds, submitted to the House of Representatives on June 10 the following resolution:—

"*Resolved*, That the Committee on Public Buildings and Grounds be, and are hereby, authorized and directed to inquire into all matters pertaining to the preparation and furnishing of all material for the construction of public buildings and the manner of constructing the public buildings of the United States under the different systems adopted by the Government of the United States, and to report to this House by bill or otherwise what legislation is necessary to secure good material and good and suitable work at fair and reasonable compensation to the mechanics and workmen employed on public works; and said committee are further instructed to inquire into all expenses pertaining to the erection of the public buildings of the United States, and to make all such further inquiries as they may deem proper. And said committee are authorized to send for persons and papers and to administer oaths. And said committee are further authorized to employ a stenographer at a fair compensation. And said committee are authorized to appoint a sub-committee of its own members, for the purpose of pursuing these investigations; said committee when appointed to have all the powers conferred by this resolution. And said committee or its sub-committee may make their investigations either at the city of Washington or at any of the cities or other places where public buildings are being erected or material prepared, as they may deem proper. And said committee or its sub-committee may sit during the sessions or recesses of Congress; and the expenses attending the carrying out of these investigations shall be paid out of the contingent fund of the House of Representatives, not to exceed $5,000, and the Clerk of the House of Representatives is hereby authorized and directed to pay the same."

The resolution has been referred to the Committee of the Whole.

THE VOYAGE OF THE DORIAN.—The State Department has received a despatch from the United States Consul at Constantinople, which states that Mr. J. T. Clarke and Mr. F. H. Bacon have reached that city in the Dorian, a sloop-rigged boat of about two tons' measurement. These are the two gentlemen whom we have mentioned as making an expedition, under the auspices of the Boston Chapter of the American Institute of Architects, and of certain gentlemen interested in the subject, to Greece and the Grecian islands, to examine the Doric remains. Mr. Clarke is reported to nearly have lost his life in a heavy gale which was encountered probably in the Black Sea, and not on the voyage across the Atlantic, as the newspaper states,—for the voyage of the Dorian began from London and not from Boston. The Dorian has made her way to Constantinople by going up the Rhine, until stopped by the low water in a certain canal, through which her course lay, which forced her crew of two to take her by rail to the upper waters of the Danube, down which she sailed to the Black Sea and thence to Constantinople.

MIRROR PHOTOGRAPHS.—The *Deutsche Allgemeine Zeitung* makes the incredible statement that a German, named Karl Steinbach, has made an important discovery in photography. After years of study and experiment, he has succeeded in obtaining a chemical composition, by means of which a mirror image may be fixed and sold as a photograph. With this composition the mirror surface is painted, and the back part of the mirror receives also a coating of oil. The mirror thus prepared is held before the person who is to be photographed. The oil coating evaporates, and the likeness of the person remains in natural colors on the light surface. The image, so fixed, is brought into a bath, and is exposed half an hour to sunlight, before delivery. A rich capitalist in Peru, it is said, has acquired this invention for $400,000, and large establishments are to be formed in North and South America for carrying it out.

THE MEXICAN EXHIBITION.—It is said that the Mexican International Exhibition has been abandoned.

A PARLIAMENTARY REPORT ON THE ELECTRIC LIGHT.—A dispatch says that the Parliamentary Committee's report on electric lighting says that sufficient progress has been made to encourage the belief that electricity has an important future for illuminating and as a source of mechanical power. The electric light, even in its present state of development, may be advantageously used for large areas, whether open or closed; but it is not so far matured as to compete with gas for domestic purposes. The committee therefore do not recommend any legislation for applying the light to private purposes, but do recommend that no legislative restrictions be allowed to impede its further development. The committee think sufficient power already exists for applying it to open spaces and large centres; but if such power do not exist, it should be granted under proper regulations. They consider, however, that the time is not yet ripe for allowing private companies to break up streets in order to supply electric light, but they advise that municipal authorities should receive all possible help for public lighting by electricity, and that the Legislature should be willing to give all reasonable facilities for extending the use of the electric light where proper demand for it shall arise. They consider that for lighthouse purposes the electric light has established itself, but they have not been able to satisfy themselves, from the evidence, that electric lighting is economical as compared with gas.

LIGHTING THE CAPITOL BY ELECTRICITY.—A Washington (D. C.) dispatch of the 5th inst. says: "The arrangements for lighting the Capitol building with a new electric light are nearly completed. The experiment has already been made in the hall of the House of Representatives, and a single light placed on the front row of the reporters' gallery and over the Speaker's chair made the whole hall so light that print could be easily read at the points farthest from the burner. The plan is to place four lights in the hall, and it is now believed that they will be a very great improvement upon the present arrangement of gas-burners. Three electric machines have been purchased under the appropriations for lighting the interior of the building, and it is in contemplation to place another in position for the purpose of supplying a light of vast power upon the top of the dome. It is claimed by the inventors that a burner can be constructed there which shall have a very appreciable effect upon a large area of the city. It is claimed that with the steam power of the heating and ventilating apparatus in each wing of the building, a dynamo-electric machine of 175,000 candle-power can be run."

THE MISSOURI RIVER.—To be appreciated it [the Missouri River] must be seen and heard during the April or June rise, when its waters are red and thick with the powdered soil they have brought from the mountains and stolen from the farms in the valleys. Then it pours, and swirls, and eddies along with a treacherous sound between a chuckle and a half-suppressed whisper, that repels while it fascinates the listener. It has made millions of acres of rich black deposits, on which it still holds a mortgage, the foreclosure of which no man can foresee. Hundreds of farmers, after clearing away the heavy timber and raising fine crops year after year, on their eighty or more acres of deep, inexhaustible river bottom, have seen their entire possessions swept away in a few days by a sudden and unexpected "change of channel" during an April or June "rise." These changes of channel have different causes. Sometimes a giant cottonwood tree that has been uprooted where the river has raised upon the forest above, is borne down by the current and lodged in the mud, where it will gradually become imbedded in the yielding bottom, and perhaps lie in wait for months, or even years, without giving any particular sign of existence. At last an unusual rise takes place, and then this hidden "snag" creates a diversion in the strong current, which begins to circle round the spot, and which culminates in a boiling eddy. The eddy increases in depth and force, gradually diverting the water from its former course until a new pathway is formed in the river bed. If the eddy is located near the shore at the upper edge of a promontory, and the water is sufficiently high to overflow the flats, a new channel is sometimes carved straight across some valuable farm or timber strip, and a river town, where steamboats took freight and passengers last year, may be from two to six miles distant from navigable water next year. A few years ago Forest City, Mo., was kissed day and night by the dirty lips of this Western flirt. To-day the river sports miles away, out of sight of the old cave, and is whispering soft things to White Cloud on the Kansas side, which has gained a river, while the State has lost several thousand acres of productive cotton land that now supports cattle and hogs in Missouri. Missouri River towns are never safe, except when located on bluffs, or tablelands, like Omaha, White Cloud, St. Joseph, and Kansas City.—*St. Paul Pioneer Press.*

ABSORPTION OF WATER BY WOOD.—M. E. J. Maumené finds that the absorptive power varies in different woods, when dried in a vacuum, between 9.37 per cent and 174.86 per cent. The maximum, 174.86 per cent, or $\frac{7}{4}$ of its own weight, is found in chestnut timber. The moisture contained in wood in its ordinary state varies between 4.61 per cent and 13.56 per cent. The absorptive power varies but little in different samples of the same wood.—*Les Mondes.*

ROMAN REMAINS NEAR DUEREN.—The *Cologne Gazette* states that the Villa of Marioweiler, near Dueren, has turned out to be a perfect mine of Roman ruins. Enough of the villa has now been laid bare to allow of the apartments of the bath being marked off with considerable precision—viz., the tepidarium, the caldarium, and the frigidarium. A part of the stove and of the hot-air clay pipe has also been excavated. A tile bearing an inscription has likewise been found. It is not yet definitely deciphered, but seems to bear the date of the 11th year of the reign of Augustus—that is, 19 B. C. Photographs of all the finds are being made. The coins found date back to the fourth century. A number of articles, including a lock, spear-heads, jugs and pitchers, and a serving dish, have been collected from among the broken tiles and other rubbish which encumber the foundations.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

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BOSTON, JUNE 28, 1879.

CONTENTS.

AT the time when the transfer of the Wilson obelisk to London was attracting most attention, the New York *World* announced a scheme for bringing the fellow obelisk, the original "Cleopatra's Needle," to New York. The project made some talk for the time and then faded out of notice, while the English undertaking was carried through, and the obelisk set up at last on the Thames embankment. Now the *World* takes the American world by surprise by announcing that negotiations which have been going on for eighteen months at its instance are completed, so that the Khedive has "most graciously and liberally offered this magnificent monument to the commercial metropolis of the New World;" that the official announcement of this conclusion has been received by the State Department, through or by which the negotiations have been conducted; and that the money necessary to carry out the scheme having been long ago promised "by the splendid liberality of a single citizen of New York," the business details of the transfer will be prosecuted with all proper and possible celerity. It is then to be taken as determined, we suppose, that, if the needle can be safely towed across the Atlantic as its companion was through the Mediterranean and the Bay of Biscay, we shall in the end see it really set up in New York. We may naturally assume that the engineer who will be charged with the transportation will be Mr. Dixon, as was suggested when the scheme was first proposed, and that the process will be that which served so well for bringing the Wilson obelisk to England.

THE question that then offers itself is, where to lodge the new immigrant, and for this the *World* suggests the reservoir square, between Fifth Avenue and Sixth Avenue, at Forty-second Street, the reservoir, as it says, being removed. In this way, thinks the *World*, "we may anchor and preserve to the uses of a park a square which is particularly exposed to the ravages of false municipal economists, of speculators and jobbers." At the same time it suggests, perhaps a little inconsistently, that the position may be made still more appropriate by building some day on the Sixth Avenue side of the square an armory, which would make "the best possible background" for the obelisk. The position seems a good one, but an armory on the Sixth Avenue side would make, we should think, a most obscuring foreground rather than a background, from that thoroughfare at least. At the time when the armory question was rife in New York, a year or so ago, this situation was named and was strenuously opposed on the ground of the ravages which the *World* rightly deprecates. As for a background, the reservoir itself happens to be the only Egyptian building in New York, except the Tombs, and therefore might furnish the nearest approach to an appropriate background that we are likely to see. It is not very good Egyptian, certainly, and might seem to its aristocratic kinsman but a poor country cousin; but still it is Egyptian in intention, and has the advantage of looking much older than any of its neighbors. With its broad low mass, its look of age and consanguinity, it would at least give the kind of architectural contrast which the Egyptians took care to provide for their obelisks, and would come as near as anything could to making Cleopatra's Needle look at home in New York. To be sure, it is on the wrong side of the square, and would cut off the illustrious visitor from Fifth Avenue; but it is there. The Boston *Post* suggests that the *World* should wait to see where the coming American World's Fair is to be held, and should "locate it there through the exhibition." But obelisks — the Egyptian kind at least — are not exactly things to be shifted about and set here and there at pleasure. It would not ill suit our Yankee time and aspirations to devise an obelisk that could be carried about and placed to suit an occasion, but it would not be Cleopatra's Needle.

THE promoters of the Spinola steam-heating scheme in New York have not yet, we believe, made any substantial progress in their actual work; but they have just been besetting the Sinking Fund Commissioners for an extension of their franchise. This franchise, granted last year against considerable opposition, allowed them to lay their pipes under control of the Commissioner of Public Works in the streets south of Chambers Street, and their appeal was for permission to go north of that limit. The question of payment to the city for the franchise was brought forward, as it had been before, and this time the representatives of the scheme apparently undertook to disarm opposition by offering that after 10 per cent on the investment had been reserved for the investors, 5 per cent on the remaining profits should be paid over to the city as compensation for the franchise. This dole, however, of a percentage on a percentage seemed to the commissioners, as the mayor argued, "ridiculously small," and when the permission was finally granted to extend the area of steam piping northwards from Chambers Street to Canal Street, it was on the condition that after 10 per cent in profits had been divided, the next 3 per cent (on the whole investment) should be reserved for the city, the whole concession being contingent on the approval of the Common Council. The city then, if the concession is ratified, is fairly committed to this policy of an indirect tax on the consumers, a policy which logically carried out would include horse railroads, elevated railways, gas companies, even omnibus lines, and any other "institution" which had permission for special use of the public streets on the ground of public convenience. The tax in this case being contingent on the profits of the scheme, the need of a special provision for it in the tariff of the company is avoided; but if the Spinola company ever gets so far as to pay its dividends, it may become a nice question whether it is for its interest to lower its tolls and shirk the city's payment, to the satisfaction of its customers, or raise them in the hope of reaping an additional dividend for stockholders after the city dues are paid.

MEANWHILE another projector, Mr. W. E. Wright, proposes to supply the city with gas to be used as fuel, made from the peat which is found in bogs in the northern part of the State. The only things which differentiate Mr. Wright's proceeding from those of ordinary gas companies are that, as he claims, the peat gas would be cheaper to make and of better quality than the common, and that it would be made on the spot and carried to New York in pipes, saving transportation of the peat. One would think, however, that the cost and insecurity of some hundreds of miles of main pipes laid for mere transportation would go far to make up for this saving; unless, indeed, opportunity were made to supply the towns along the route, in which case, we fear, but little of the gas would reach New York. Mr. Wright proposes, by the way, to avoid burying his gas mains in the New York streets, as far as may be, by hanging them to the tracks of the elevated railways.

THE Brooklyn Jail is one of the buildings which, like the Indiana State House and the Chicago City Hall, are always under a cloud. It has been the centre of one fight or another from the time when, eighteen months ago, the Supervisors set about choosing their architect. When the contracts were given out some time ago, it may be remembered, the stone-cutters of Brooklyn attacked the Supervisors, and succeeded in getting a provision inserted that the cutting should by done in their county. The provision proved ineffective, for we now find the stone-cutters again besetting the Supervisors, this time with a formal accusation, presented by a committee, which virtually charges collusion between the architect and the contractors, alleging that the specification has been altered since the contract was signed; that the stone has not been cut in King's County but in Maine; that the sills and lintels have been changed from granite to iron

at the instigation and for the profit of the contractors, who, it is intimated, save some thousands of dollars by the operation; and that the stone-work is inferior to what was specified, being rock-faced granite instead of cut Greenwich stone, and without the required amount of through-stones or binders. The inquiry of the Supervisors, which drags somewhat, has not been closed when we write, but it would appear from the testimony that the stone-cutters had not informed themselves with great care; for of the committee of two which offered the charges over their signatures, one proved not to have read the charges, and the other not to have read the specifications attached to the contract. The chief point substantiated seems to be that the stone is cut in Maine, in violation of the terms of the contract. This the contractors do not venture to deny; but they say that they found it impossible to get workmen in the county to do it. It appears that the change from stone lintels to iron was made before the contract was signed, and the architect maintains that the iron sills and lintels, for which the complainants forget to allow, will cost the contractors more, setting included, than the stone ones would have cost. The changing of the stone the Supervisors are ready to consider to be within the province of the architect as superintendent. Considerable testimony was offered concerning the quality of the stone-work; from it we are led to infer that the work supplied (the jail has not been long under way) is not as good as the letter of the specification called for, but perhaps as good as the contractors expected to be required to furnish under the specification, and very likely as good as other contractors would have furnished.

It is one of the curious facts of architectural practice, unacknowledged, but tacitly recognized and acted upon, that the accepted standard of specification is higher than the accepted standard of practice. Most architects are in the habit of specifying with rigid formality requirements which are above the quality of such work as is commonly called good. The contractor assumes unhesitatingly that he will not be held to the letter of the requirement, and estimates accordingly; ordinarily he is not held to the letter, but does his work according to the standard which prevails among mechanics, and only approximates more or less to the ideal of the specification. This is one of the pervading abuses of the contract system. It is a pretence which is demoralizing in its way, but is sufficiently transparent, and must be taken into account in judging any individual. It is one of the foremost causes of misunderstanding between uninformed clients and their architects and contractors, and furnishes the most inviting opportunities to those who are minded to stir up strife between them. It makes it impossible to settle their disputes to the satisfaction of a strict interpreter of contracts, or to judge fairly of them except by reference to standards which, being really unwritten, are necessarily more or less uncertain and elusive when brought to a close test. In this case it was specified, it is said, that every third course in the ashlar should be a binder or through course: it was testified that there were no through courses, but that the work was what would be commonly accepted as good work. We are justified in assuming that the mechanics who read the specifications and figured upon them did not expect to be required to carry every third course through, but only to furnish as good work as it is common to render under a specification of that ostensible severity. That this is not a wholesome system under which to do work we need hardly say; but it is a very common one.

There is something almost pathetic in the appeal which the Brooklyn World's Fair Committee, now that the United States Board of Trade is apparently beaten off the field, has sent to the New York Committee, advising and even imploring the choice of Prospect Park in their city as the site of the exhibition. The appeal argues that if the exhibition is held in New York itself, it will fail, and people will not visit it, simply because New York is in the summer months, and is known to be, such a hot and uncomfortable and unwholesome city, that people run away from it instead of seeking it. Prospect Park, says the Committee, is on the contrary the highest land in the immediate neighborhood of New York, is removed from the densely populated part of the city, "and, while only three and a half miles from the New York City Hall and Post Office at one end, is only five miles, or twelve minutes, from the Atlantic Ocean at the other." In conjunction with Coney Island, in fact, it has become the great sanitarium of the two cities. The only real obstacle to fixing the exhibition in Brooklyn, say the authors of the appeal, is the pardonable local pride which makes New Yorkers naturally desire to hold it within their own city limits. But, they add justly, the people of New York and Brooklyn are in reality one commercial community; they are "two lobes of the same lungs, with the same blood coursing through both;" and of the money which might be spent in Brooklyn the greater part would return through New York, even from Coney Island. We do not know what ear the men of New York will lend to this appeal; but they will probably remember that to visitors from without the two cities there will not appear any great distinction of climate between an exhibition on New York Island and one just across the East River. The natural conditions of choice are convenience and accessibility of site, and the health of visitors will depend much more on the wholesomeness of the places where they live than on where the fair is, in which respect there would probably be no great difference whether it were on one island or the other. The considerate people of New York have strenuously resisted the idea of giving up Central Park to the exhibition, because of the damage to it, which must ensue; we should think the people of Brooklyn would have some hesitation in offering their beautiful pleasure ground for such a use.

We gave several months ago (*American Architect*, August 10, 1878) some account of the position and intended form of the New Eddystone light-house. Probably nothing would have seemed a greater paradox to Smeaton and the early admirers of his work than that his tower by its unyielding solidity should bring on the downfall of the rock to which he laboriously anchored it. But since the alarm was taken the unsettling of the rock has gained so much, that it begins to be doubted whether the old tower will hold its place during the five years which will pass before the new one is ready for the light, and Trinity House has undertaken to provide a light-ship to take its place. What steps have been taken in behalf of the keepers, who may be expected to fall with the light-house when it goes down before a gale, as it was thought to have gone down in the storm of last October, we are not told. The difficulties of the site make the new work go on slowly, although all the material is made ready on shore for its position. In the first seven months, beginning with July of last year, only one hundred and thirty-five hours' work, it is said, could be done on the site, and it is expected to take the rest of this year to bring the masonry up to the level of high water. The tower is to contain, above its twenty-five feet of solid stone, nine stories of ten feet high. Their walls of solid granite, eight and a half feet thick at the base and diminishing to two feet and a quarter at the top, are to be built entirely of through-stones, and will be, it appears, wrought to a fine polish on the inside, with what object we do not guess, unless it is to economize light by reflection, and allow the window openings to be made as small as possible. By increasing the height of the tower beyond that of the old light-house so as to lift the focal plane of the light a hundred and thirty feet above high water, and probably by using the electric light, it will be possible to throw the light much farther, both in clear weather and in fog, the radius of illuminated area due to the light being seventeen miles and a half. It is proposed to duplicate the illuminating apparatus, so as to have a resource in cases of accident, and to further increase the penetration of the light in foggy weather. A siren is to take the place of a fog bell, — a curious nineteenth century reversal of the legends of twenty-five centuries ago, when the Sirens set themselves to lure the sailors of Ulysses on to the rocks of the Italian shore. M. Cagniard de la Tour, when he gave this seductive name to his unmelodious instrument, could hardly have imagined by what antithesis his christening would by and by be justified.

THE HYPÆTHRAL QUESTION.

As far as can be judged from the few and scattered remarks of the ancient writers which touch upon the subject, the idea of the temple interior was connected with that of a complete roof. This same sitting statue of Zeus at Olympia was so tall that it nearly reached to the ceiling of the naos, and there was a jesting complaint concerning it, that, if the god should rise from his throne, he would be in danger of breaking through the roof.[1] This apparent misproportion was really the well-considered intention of the designing artist, who thus characterized the temple, which was in itself a votive offering, as but a frame to the symbolical figure, not as the dwelling-place of the Deity.

[1] Strabo, viii. 3, 30, ἀπτόμενον δὲ σχεδόν τι τῇ κορυφῇ τῆς ὀροφῆς, i. e., appeared almost to touch the uppermost ceiling, in contradistinction to that of the lower aisles, the hyperoon gallery.

The negative testimony of literature is, however, of greater weight than the positive. The ancient authors, while mentioning every other part of the temple, are unanimously silent upon the subject of an opening in the roof, and yet such a strange and difficult manner of procuring light would surely have called forth some remark, though it had been adopted in but a single instance.

If, indeed, the temples had been constructed with an opening in their roofs, the practical consequences would have been of the gravest importance. Sun and wind, dust and rain, would have found free access to the sacred interior, to the delicate and valuable offerings, to those statues which, formed of ivory and gold, were the work of the greatest Hellenic sculptors. There are accounts of the care with which these statues were protected, even from such slight variations of dampness or dryness as might be caused by the quality of the earth beneath the building in which they stood. Ivory in thin plates is a substance most sensitive to moisture ; it can neither bear the dry heat of the sun nor the dampness of rain. Fastened as it was in these statues around a core of wood by innumerable dowels and dovetailings, any swelling or shrinkage would have been destructive. The structure was so complicated that the restoration of a chryselephantine figure which had fallen to pieces was accounted by the ancients nearly as difficult a work as its original creation. In the temple of Asklepius at Epidaurus, the throne and statue were kept in an equable temperature, and in a hygrometric state of the atmosphere as unvarying as possible, by being placed over a well.

In the low and swampy Olympian plain, at the junction of the Kladeus with the Alpheus, one of the very few rivers in Greece which flow during the heat of summer, the dampness of the soil would, without precautions, have proved destructive to the statue. On this account, the figure itself was not only frequently rubbed with oil, but the pavement around its base was also saturated, that the moisture might not come through the porous stone which composed the substructure of the temple and swell the ivory while rotting the wood. To still further diminish the danger, another and denser kind of stone was used immediately under the base, and this pavement had a border, or rim, to catch and hold the oil which had been poured upon it.[1]

When such care was taken to mitigate the comparatively trivial effects of the moisture conveyed by the exhalations of the earth beneath a Doric krepidoma, what could have prevented the destructive influence of pelting Grecian rain-storms, if a large gap had been left in the most important part of the exterior protection of the building itself? On the Acropolis of Athens, the danger, if different, was scarcely less. The height and nakedness of this cliff make it probably the driest spot in all the naturally parched and unwatered Attica. With the thermometer rising at times to thirty-five or forty degrees Celsius (Centigrade) in the shade, and to fifty degrees, or even more, in the blazing sun, only dense shade, the coolness of great masses of stone, and artificial moisture could secure the statue from warping to pieces. But here, also, care was taken. Underneath the statue there was a separate foundation of tufa, most porous of stones, and the naos was lightly sprinkled with water, which by evaporation kept down the temperature, and prevented the interior from becoming so excessively dry as the outer air.[2] A building with an incomplete roof upon the Acropolis of Athens would have been exposed to most inclement changes. When passing thunder-storms break here, they deluge the land almost instantly. Around the north of the city there are systems of trenches which encircle it like small moats. The protection they afford is from the attacks of nature ; they were dug to receive and divert the winter rains, and so save the streets of the city from sudden inundation. These storms could not have been less frequent before the dense forests of the neighboring countries had been so entirely swept away by generations of devastators. Storms of sleet and snow are also occasional visitors to the Greek landscape, especially at Delphi, and would have caused great injury if admitted to the valued paintings, carefully wrought silk tapestries, and the rich offerings of precious metals. Yet nowhere is any arrangement to be found upon the floors of the temples to lead off the water which would have fallen upon them had the roof been an ineffectual shelter, — an enexplicable omission, if we suppose there was a possibility of in-falling rain. Pools must have stood in the interior after every shower, as there was little chance for wet to escape through the tight joints of the pavement. This is clearly to be seen in the Parthenon. The depression in its floor has nothing to do with fallen water, as has been suggested ; it has no opening, being bounded towards the door by the threshold, and would have aggravated rather than have diminished the trouble of standing pools. It is an architectural demarcation. The columns within the naos cannot ideally stand on a dead level with the space which they inclose. The rise is their base, a light suggestion of the stylobate, an integral part of the columns themselves. In the temple of Poseidon at Pæstum the sinking, necessary for the same reasons, is under the hyperoon. The stylobate rises in the centre, not on the sides as in the Parthenon, and clearly shows that the depression was not intended to receive rain. A similar demarcation may be observed in St. Sophia of Constantinople, a reminiscence held fast through centuries by its Greek builders.

When such accounts are left of the precautions which were taken to protect the building and its contents from the dampness or dryness of the earth beneath, it is strange, if the temple is supposed to have been open to the sky, that there is no mention of the makeshifts to which its keepers would have been put by such exposure. It is unnecessary to dwell on these evident practical objections. Their evil effects would not have been confined to the gradual destruction of the interior, but must have caused the greatest discomfort and inconvenience to all who entered the sacred precincts. The glaring sun and gusty wind would alternate with storms of rain and dust to take from the interior the real character of an asylum which it ideally enjoyed. The sacred naos would, in unpleasant days, have been as unpleasant a locality as any unroofed court surrounded by high walls. To partially obviate such troubles, it has been suggested that an awning of cloth, a velarium, was stretched over the opening. No mention of such a device is left us from antiquity, but apart from this and the difficulty that must have attended the furling and unfurling of so great a sail in such a position, the winter's wind would not have failed to rend it in strips at the very time when most needed as a protection. December gales yearly overthrow numbers of the wretched little houses of the poorer quarter of modern Athens, and could not have failed to wreak mischief upon an unroofed house with such a flimsy protection. Cloth is not sufficient shelter from drenching rainstorms. The simple curtains of the Greeks had other functions. That of the Artemision reached from the ceiling to the floor, and, when it was let down, hid the figure from view. Such curtains were customary in Egyptian temples, which in many ritualistic respects were the prototypes of the Greek naos. The proto-Doric peripteral cellas of Egypt, still in a perfect state of perservation, had no openings in their ceilings to admit a light which was not desired for the services held within them. In the history of the ritualistic, as well as of the architectural development of the Greek temples, the introduction of daylight would be inexplicable.

The destruction of the roofless interior by the elements advances even to-day with incredible rapidity. Lines which Knowles measured and drew were found by Penrose, but few years later, totally obliterated. Penrose saw colors which Boetticher could no longer distinguish. Certain interior remains of the Erechtheion which were designated by Inwood have since been washed away, and can no longer be seen. For more effective protection, hatchways, or shutters of wood to cover the opening, have been proposed by other advocates of an hypæthron. But these complicated constructions, if they were indeed possible, must have been exceedingly cumbrous. To plan and execute such lids, and to arrange them upon the roof, in a suitable manner, would certainly have been difficult. In what way these shutters could have been flapped open or rolled away to let in the desired light, and closed at an instant's notice of approaching rain, appears no more than does their whereabouts when not covering the opening. Architecturally, such an arrangement would seem to have been in all respects uncharacteristic of the Greek modes of construction. Imagine the Athenians in the Parthenon, or the Amphictyonic Council assembled in the temple of Delphi, seeing themselves immured in sudden night because the janitors perched upon the roof of the building as a lookout foresaw a shower, and, operating upon these hatchways, covered the interior with them, — an interior which, it is true, would suffer incalculable injury without adequate protection. Dismal enough must have been the jarring and creaking of the heavy shutters as they were closed, the loud pattering of the rain upon them, and the occasional drip from imperfect joints. The rattle and reverberation of the falling water upon the glass skylights of the Bavarian Walhalla, the only real hypæthral temple which ever existed, is quite deafening, and constant dripping and repairs are the price paid for the experiment. Within the Hellenic temple there must have reigned a sacred and a protected calm. The great mass of the stone walls, and the outstanding columns, protected the naos at the side ; the sacred ceiling, symbol of the great dais of the sky, and the stone roof which spread over it with eagle wings, completed the shelter and security from above.

The danger to the interior, if these were broken through, would not have arisen solely from its exposure to the elements ; the collected treasures would not have been secure from sacrilegious plunderers, since, however great a desecration such robbery was esteemed, the worth of the offerings, of the symbolical figure itself, and even the sums of money deposited for safe-keeping in the sacred treasury, offered too tempting a prize. Dr. Ross has suggested how easy it would have been, had an hypæthral opening existed, to mount to the cornice at the side by means of ropes or other contrivances, and to let one's self down through the unprotected shaft directly into the space where the rich booty lay uninclosed. A curious remark on this subject is made by one of the Greek authors, who, speaking of a temple, the roof of which had been destroyed, asks, " Who would be willing to deposit his gold and valuables in a house without a roof ? "[3]

There is certainly no reason evident from the destination of the temple, why its interior should be opened to the air and daylight. It was once supposed that burnt sacrifices were offered within its walls, and, had this been the case, some orifice for the escape of the fetid smoke would have been imperative. But archæological researches have shown, beyond doubt, that this was never the custom. In the naos there stood a table upon which votive gifts were laid; the burnt-offerings were consumed on the altar, which stood in the temenos, at some little distance from the building, in a line before the door.

But the reasons already advanced are not those upon which I would lay the greatest stress in the argument against the open roof, nor from

[1] Paus. v. 11.
[2] Paus. v. 11.

[3] Strabo, xiv. 1. Literally, " in an hypæthral cella," for this is the passage referred to above, p. 195.

which the conviction that no natural light was admitted to the naos has been gained. The literary testimony is negative, possibly the practical objections could have partly been obviated by the adoption of expedients now unknown — expedients inconceivable by modern architects, who, with the powerful assistance of iron and glass skylights, are not obliged to invent palliatives for so uncomfortable an orifice. But there are other grounds which, dependent on the changeless laws of architecture, go partly hand in hand with these practical considerations, for truly no art is more amenable to reason, and which are partly founded on a purely æsthetic basis. On these may be urged the strongest arguments against an hypæthral opening. In the history of art, such a manner of admitting light, as systematically pursued as we have been taught to consider it, would be unparalleled. The nomadic savages of Central Asia, and the more degraded tribes of our own Indians, are the only builders who ever have introduced light into their structures by unglazed horizontal openings. Can it be supposed that Greeks of the age of Pericles adopted such a barbarous manner of illumination for temples which were their national pride, the expression of the highest development of architecture which the world has known?

ARTISTS OF THE NINETEENTH CENTURY.

Mrs. Clement has an eye for the wants of the reading public, as the success of her previous compilations has shown. The Artists of the Nineteenth Century,[1] the joint work of herself and Mr. Hutton, is a natural sequel to the other books, and aims to meet a want which most readers of the literature of the day, serious but not expert, must have often felt. The book does not profess to be critical either in judgment or in selection, but simply a general dictionary of artists containing such information as the authors could collect about the painters, sculptors, architects, and engravers of the century. The number of artists mentioned is large, the dictionary filling two stout duodecimo volumes; the information given is concise and reasonably full. The obvious sources of material seem to have been consulted, and pains taken to get what might be had by direct solicitation from private sources; so that the work contains a large amount of matter, including much that the ordinary reader would find with labor and difficulty in its original place, and other which he would have no means of getting at at all. The material is arranged clearly and with judgment; the duplication of the index is a simple contrivance that deserves to be copied in every book of more than one volume which is entitled to an index. The inquiring reader who, when he finds in a book an index worth consulting, is constantly tormented by having to turn to one volume to find where to look in another, will be thankful for the good sense which has here repeated in each volume the index to both.

In a manual of this kind only a relative completeness is possible, — not even a completeness which will fully satisfy any one person. It is impossible to include the whole body of artists who live or have lived in three quarters of a century. The most that is to be expected is that names or facts of acknowledged importance shall not be omitted; that those of less weight shall be selected with reasonable judgment, and that a fair level of accuracy shall be maintained. In this book we have not failed to find the name of any painter of special note for whom it has occurred to us to look; though we have looked in vain for known men of lesser rank, while their places are occupied by names, chiefly Americans, be it said, which we are sure that fame would fail to recognize. The facts that the writers attack their subject from the literary, not the professional side, and that in collecting knowledge on such a subject chance must necessarily play a large part, will account sufficiently for a certain air of capriciousness in selection and a want of what we may call perspective, — that is, of a sense of the relative position and importance of different men.

The authors have principally concerned themselves with painters. When we look among sculptors we find scantier justice done, and less mention of important names, and less discrimination. We find, for instance, a paragraph given to Vinnie Ream, but no notice of so famous a sculptor as Rauch, nor is Schwanthaler mentioned. When it comes to architects, though they are recognized as artists and represented by a few names, it is evident that comparatively little attention has been paid them. Among English architects, Mr. Edward Barry is mentioned, but not Sir Charles; Scott, Street, and Waterhouse, but not Burges. Of the older men we look in vain for Cockerell or Donaldson. Among the French, Duc is mentioned, but not Viollet-le-Duc; Duban and Vandoyer, but not Labrouste; we miss Hittorff; we find Garnier, but not Questel; among the Germans we miss so important names as Klenze and Stüler and Hübsch; and so on with other names taken at random. Of American architects we find only one mentioned, — Mr. R. M. Hunt. He is certainly entitled to mention, and apart from merit which may or not be publicly known we can think of two or three others, — one the president of the American Institute from its foundation, and honorary member of the R. I. B. A., — whose generally recognized position ought not to have been overlooked.

To critical authority the authors make no claim, and they refrain from passing judgment on the artists they mention. But to many of their articles are attached quotations from the critical notices of others, found in periodicals or books, often in the works of critics of reputation. These are selected without any appearance of bias, and opposing opinions are often given, sometimes with a curious intensity of contradiction, as, for instance, in the criticisms of the French military painter, Pils, which are cited from Mr. Hamerton and Théophile Gautier. These citations, we must say, are sometimes made but with moderate discrimination, and from questionable authorities, but they add to the interest of the work and sometimes to its value.

Of the accuracy of the work as a whole one could only judge after considerable use. We have found here and there a mistake, sometimes taken confidingly from Vapereau or some such customary authority, sometimes, perhaps, an original error; but as far as we can judge, the work is as well performed as is common in such handbooks.

Such books as this are to be valued for what they contain, rather than condemned for what they omit. The ordinarily studious reader will not miss from it the artists whose names are in everybody's mouth, and will find enough about them to satisfy his curiosity; for other artists of whom he may hear he can look with a fair chance of learning something about them, and the names that are there unnecessarily need not make him any trouble. These advantages are enough to make the book desirable for the reading public of a generation that is curious about artists and their works.

[1] *Artists of the Nineteenth Century and their Works.* A Hand-Book containing two thousand and fifty Biographical Sketches. By Clara Erskine Clement and Lawrence Hutton. 2 volumes, 12mo. Boston: Houghton, Osgood & Co.; The Riverside Press, Cambridge. 1879.

THE ILLUSTRATIONS.

COMPETITIVE DESIGN FOR THE UNION LEAGUE CLUB-HOUSE, NEW YORK. MR. G. E. HARNEY, ARCHITECT.

HOUSE IN ONE HUNDRED AND FORTY-NINTH STREET, NEW YORK. MR. H. F. KILBURN, ARCHITECT.

IMPROVED DWELLINGS FOR THE LABORING CLASSES.

We print the following extracts and accompanying plan from a pamphlet on improved dwellings [2] for the poor, published anonymously by G. P. Putnam's Sons, which, if we judge rightly of its authorship, is the fruit of study and practical experience in providing such homes, and which contains much sound argument and suggestion. The pamphlet also gives a plan of a model tenement-house, the latest of the three built in Brooklyn with so much success by Mr. Alfred T. White, who may fairly be called pioneer in the New York community of the movement in favor of better housing for the poor.

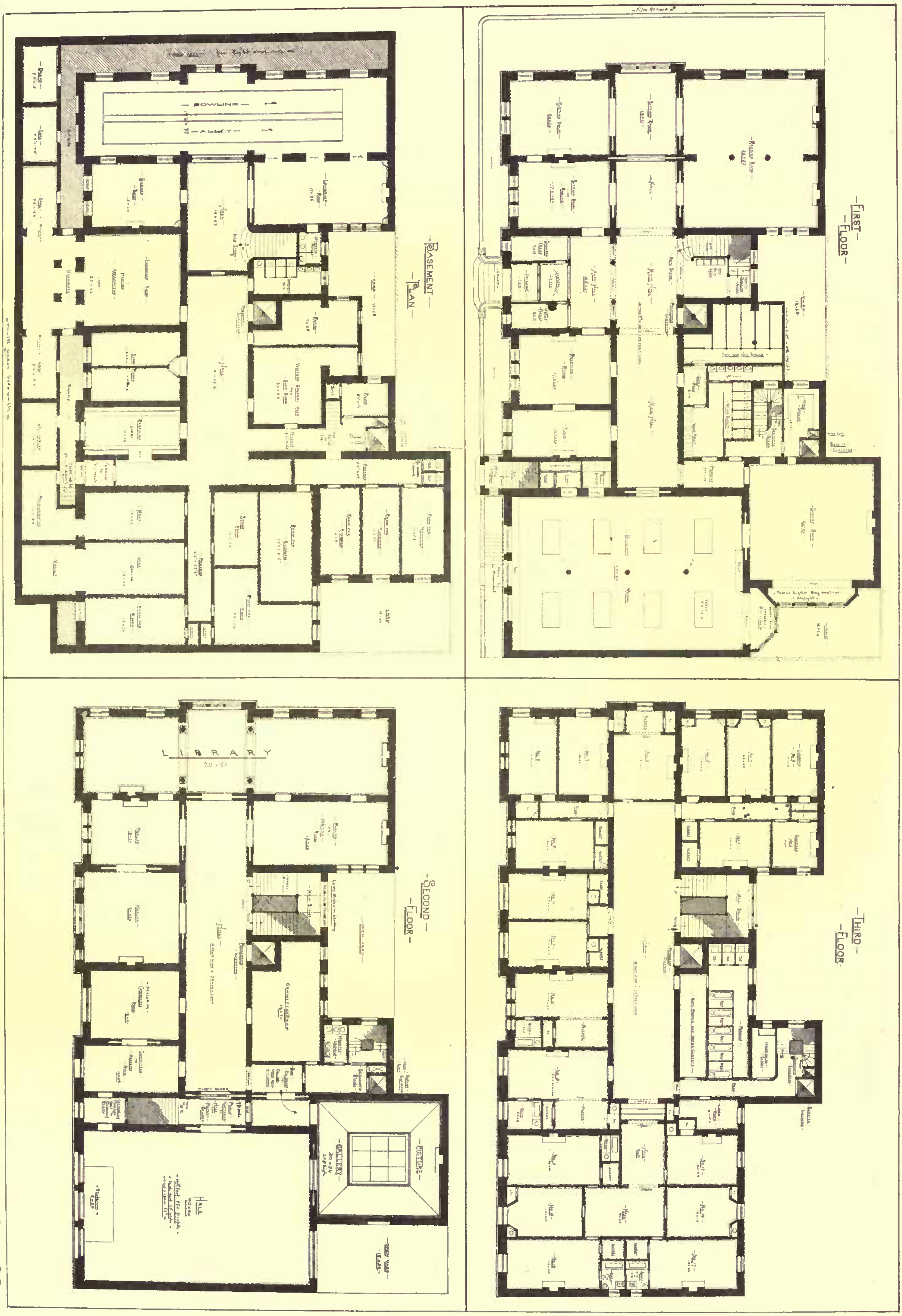
There have been recently erected in the Sixth Ward of Brooklyn, within five minutes walk of the South Ferry, thirty-four small brick houses on a plan — novel both as to street and houses — which points a way to utilize the badly shaped blocks of upper New York. A plot 112 feet front on Baltic Street, and the same on Warren Street, and extending through, 200 feet deep, situated in the centre of the block between Henry and Hicks Streets, has been laid out with a private way, called "Warren Place," running through from street to street. Warren Place is 24 feet wide, this being just equal to the height of the twenty-four two-story and basement houses which front upon it. The eight houses at the ends of the two rows front on Warren Street and Baltic Street, and are of three stories and basement each. The cart-way for ash carts, grocery wagons, etc., runs in rear of the houses, and Warren Place is laid out as a long, narrow park, with grass in the centre, and a flagged walk on either side A low iron fence, with gates at the walks, extends across each end, and a fountain will ornament its centre.

The diagram gives the lay-out of one end of the block on west side of Warren Place, showing two of the nine-room and three of the six-room houses. A different floor of each house is shown, as noted on the plan of each.

The houses fronting on Warren Place are each 11½ feet wide and 32 feet deep; these have six rooms, each with a good closet; the staircase rises with a half turn in the centre of the house. The front basement is the dining-room, and the rear basement the kitchen, being furnished with a good range, boiler, sink, wash-tub, dresser, and coal closet. A rear door from the kitchen leads into a small lobby, opening on the cartway already mentioned. From this lobby another door opens into the water-closet, thus disconnected from the house, though under the same roof. The first and second floors have each two rooms, or, say, one parlor and three bed-rooms in all. The end houses are one story higher, and contain nine rooms. The fronts of all are planned with slightly projecting doorways, trimmed with slate and bluestone, and, under the windows, slate flower sills, with ornamental guards.

The cost of the six-room houses is a little under $1100 each. With a little crowding, thirty-two houses of six rooms could be put upon a plot 100 by 200, or eight city lots. Taking $1100 as a basis of cost for such houses, when built in quantity of ten or more at a time, and assuming that a gross rental of twelve per cent per annum, or one per cent a month, will surely yield seven per cent net, it is easy to figure what rentals could be afforded in upper New York. On ground costing even $4000 per lot 25 by 100 feet, the cost of land for each house would be say $1000; add $1100 for building, and we have cost of house and lot $2100, on which one per cent per month makes a monthly rental of only $21; with land at $2000 per lot, rentals could be brought down to $16 per month, and, in the suburbs, land at $800 per lot would reduce the monthly rental to $13. Such a house is not palatial in any respect, but it certainly does afford all that is needed, even by a good-sized family. In six rooms any ordinary family can live decently, and a little added to the cost of each house would make them suited to any neighborhood. The owners of these houses aimed, in this building enterprise, to erect the best six-room house possible for a cost of about $1000, to be substantial, convenient, healthy, and attractive. Their buildings establish beyond dispute the feasibility of erecting this

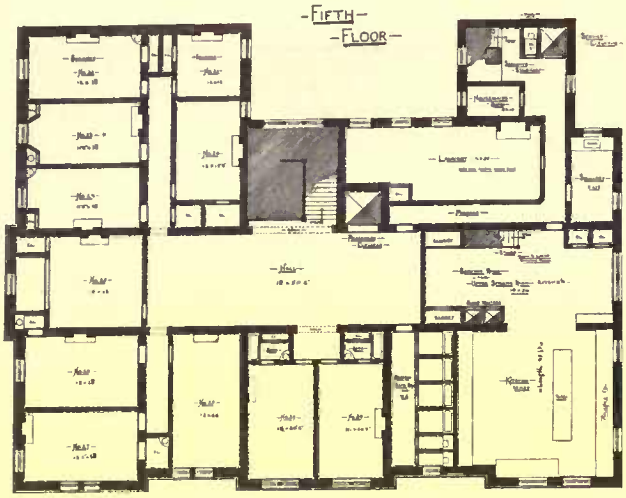
[2] *Improved Dwellings for the Laboring Classes.* The Need and the Way to Meet it on Strict Commercial Principles in New York and Other Cities. New York: G. P. Putnam's Sons. 1879.

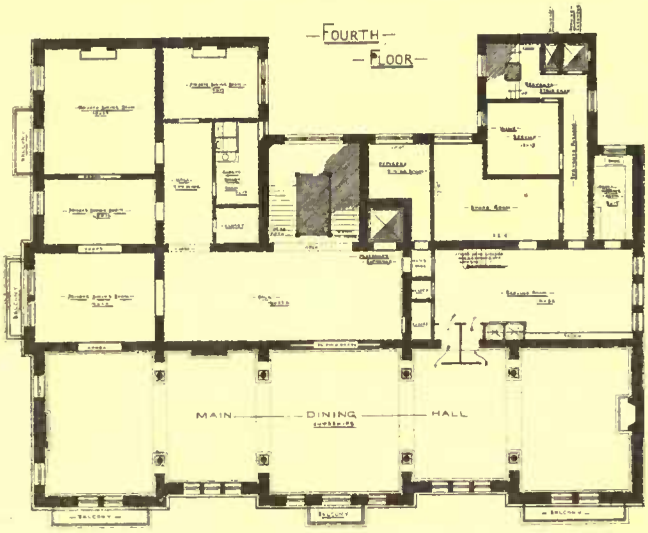


DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK

G. E. HARNEY ARCHT.

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FIFTH AVENUE FRONT

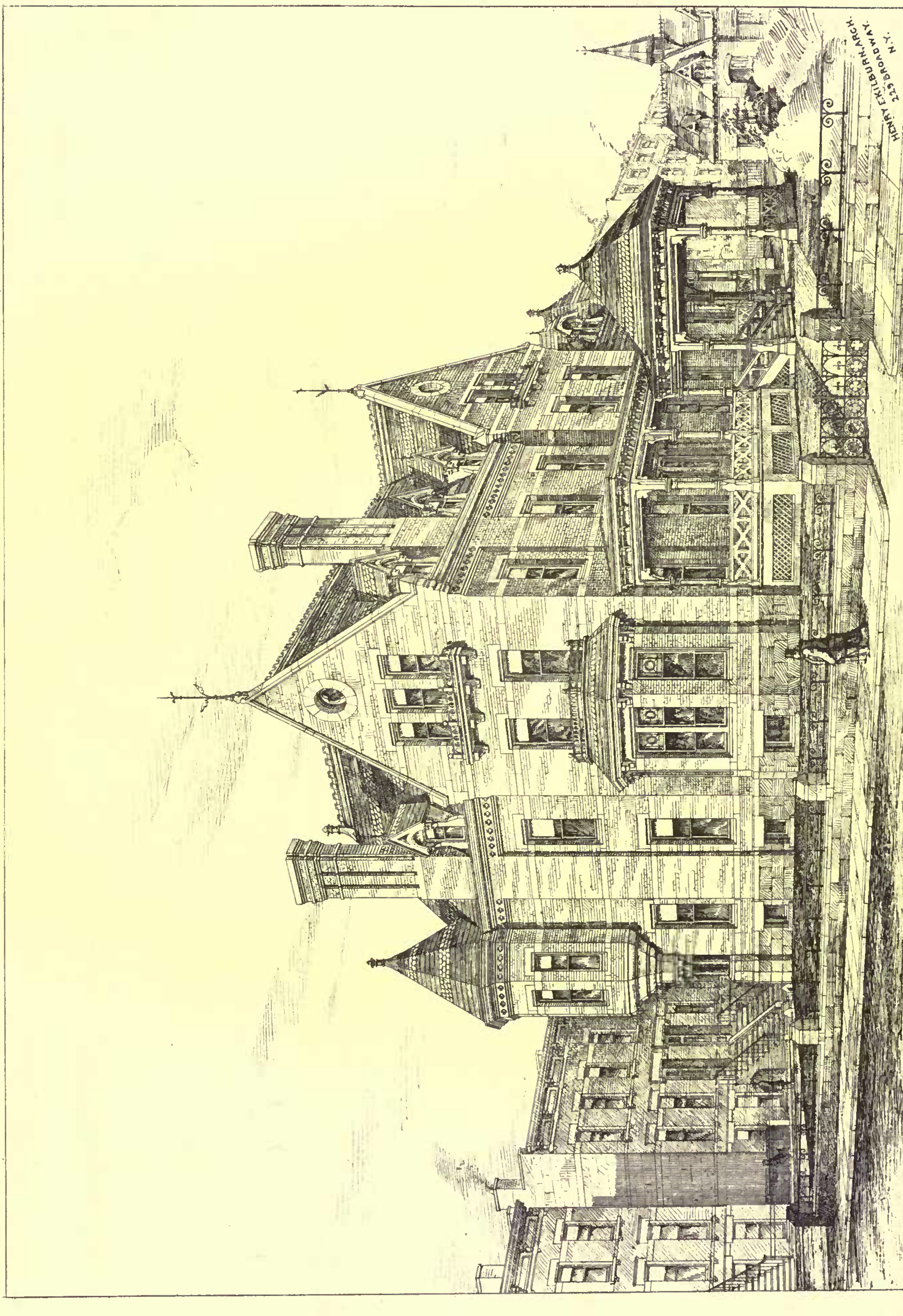


GENERAL SECTION OF HEIGHTS

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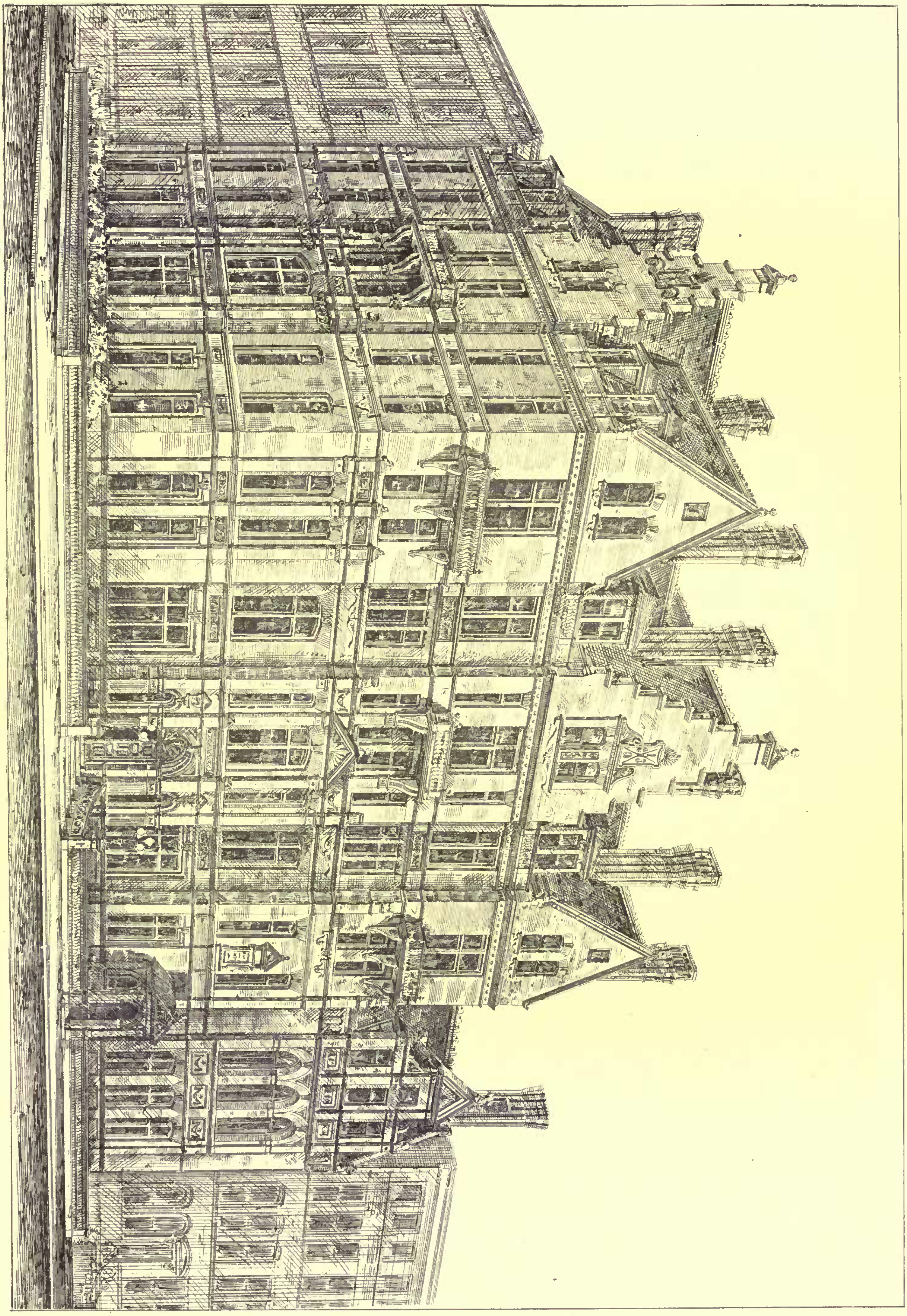
DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK.

G. E. HARNEY, ARCH'T.



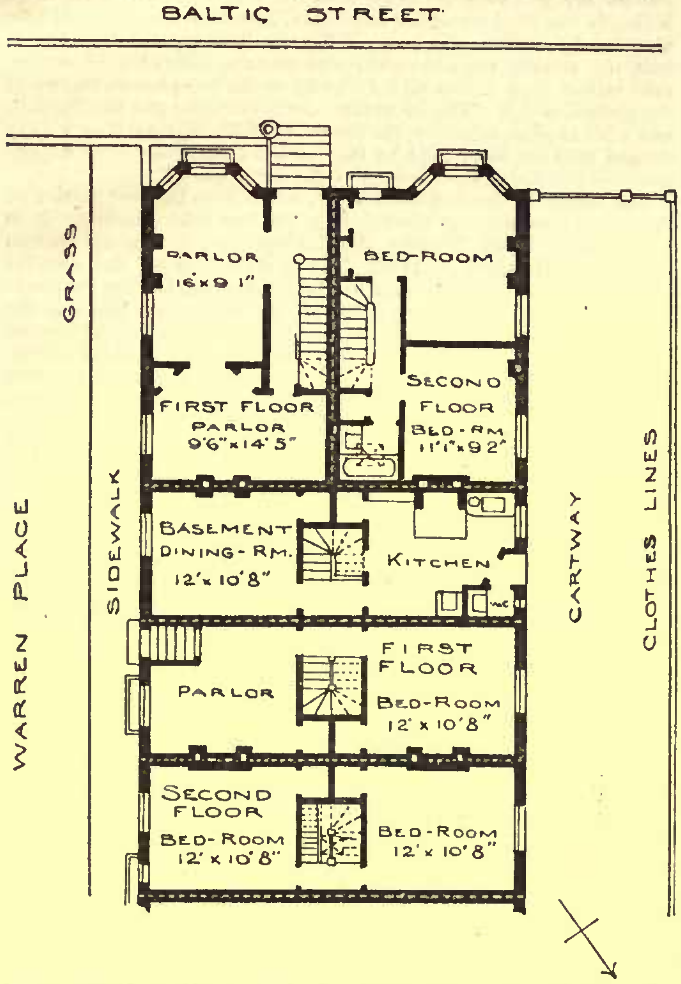
DESIGN FOR HOUSE CORNER WALTON AVENUE AND 149 STREET. NEW YORK CITY.

THE HELIOTYPE PRINTING CO. 220 DEVONSHIRE ST. BOSTON



—DESIGN FOR THE UNION LEAGUE CLUB-HOUSE NEW YORK.—

class of houses, not only in Brooklyn, but in New York; nor need they be limited to Harlem or the districts north of Harlem River. Not far east and



west of Central Park plots can be had which might be covered with small houses rented at $25 or $30 per month, with equal profit to landlord and tenant. In ten years, should the land become valuable, these little houses could be torn down, and yet the land-owners would be wealthier for having built them than should the land be left idly to consume itself in taxes.

The people who would take these houses now compete with families of less means for the best rooms in the best tenement-houses; thus crowding the laboring classes down into very poor quarters. Were the better classes provided with homes elsewhere the pressure would be relieved, and a better chance afforded to the laboring classes. As, however, any rental above $10 is beyond the reach of a majority of the laboring classes, and as few even of the mechanics or artisans can pay $15 per month, we must consider seriously what can be done for them. . . . .

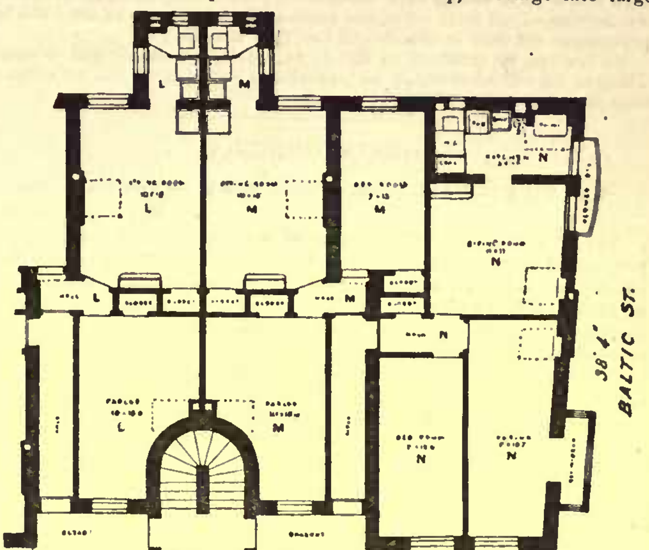
The same gentlemen who built the "Warren Place" houses in Brooklyn have been interested for several years past in erecting (under the supervision of Messrs. William Field & Son, architects) improved dwellings for the laboring classes, on plans adapted from the latest and best of the London plans, especially those of the Improved Dwellings Company. The plate published herewith shows the plan of the third block of "Home Buildings." In the plan the rooms and hall belonging to each set are lettered A, B, C, etc.

From the careful description of Mr. White's buildings, published in the Board of Health Report, the following extracts are made: —

The first attempt to build improved dwellings for the laboring classes, on plans similar to those most successfully used in London and other English cities, was made in 1876, in this city, by Mr. Alfred T. White. . . . .

Mr. White first constructed a block of buildings on Hicks Street, at the corner of Baltic, which was opened for occupation February 1, 1877, and so successfully had its proprietor met the popular demand in its construction, that it was immediately filled. A third block is now in course of erection near the first buildings. As the plan of this block combines the improvements suggested by the earlier experiences, it is given herewith.

In all of these buildings access to the upper stories is had by stair-cases open to the front. The stairs are of slate, and set in solid brickwork. In rising from story to story a half turn is made, and at the top of each flight a slate balcony, protected by an iron railing, is reached. These balconies, in the first and third blocks, are about 30 feet long. From each end of each balcony a hallway or lobby runs back, and, in the block shown in the plate, private halls, admitting to the rooms of each dwelling, lead from this hallway. Thus every family has its dwelling, A, B, C, etc., entirely private and apart from, and with no room opening into another, while all the rooms have direct sunlight. The rooms are provided with closets with hooks and shelves, and the living-room with a dresser, and coal-box to hold a quarter of a ton. Both sitting and living rooms have fireplaces and mantels. The height of ceilings is 8 feet 3 inches in the clear. The windows of all the rooms are of unusual size, and extend up close to the ceiling. From the living-room a door leads into the extension, a small room $7\frac{1}{2}$ by 5 feet. This contains an ash-flue, a sink, a stationary wash-tub, a window, and a water-closet with separate outside window. All of these conveniences are furnished to every family entirely apart from all others. The ash-flues, one foot square and ventilated at top, discharge into large



ash-rooms in rear of the cellars, separated from main cellars by a brick wall, and accessible only by doors in the rear. No ashes or refuse are ever exposed on the sidewalk or elsewhere. All refuse is burned, and the ashes are loaded directly from the ash-vaults into carts, which pass out by a rear gateway. The water supply is ample, and is carried up in a corner of the living-room, where the pipes are out of the reach of the frost. The water can be shut off from the sculleries by faucets placed in each apartment. The water-closets are all provided with cisterns overhead to insure instant supply of water. The traps are ventilated, and siphoning prevented by vent-pipes carried above the roof. The wash-tubs and sinks are trapped separately from the water-closets. The soil-pipes are open at the roof, and serve as rain conductors. These pipes pass down against the back wall of the extension and out through the rear wall of the cellars into the sewer, avoiding any horizontal drains under the buildings. Every family has a large coal-bin and wood-bin in the cellar, numbered to correspond with its rooms. Hoisting tackle is provided for the use of the tenants. The buildings are all of good red brick, and all windows and outside doors are arched with brick. Floors are of the best yellow pine throughout. The flat gravel roof is used as a clothes-drying ground by the families in the upper three stories. For the occupants of the lower stories lines are provided in the yard. . . . .

The average rentals in all the buildings are: —

	PER WEEK.	EQUIVALENT (LESS DISCOUNT ALLOWED) TO PER MONTH.
Four-Room Dwellings....................	$1 93	$7 95
Three-Room "	1 48	6 00
And the lowest rentals are: —		
Four-Room Dwellings....................	1 50	6 09
Three-Room "	1 30	5 21

The lowest rentals are of course on the top floor, and all rentals are increased ten cents per week for each floor, moving downwards. . . . .

In the closing pages of the pamphlet we find these sensible remarks: —

We are accustomed to accuse the landlords of avarice, and the poorer classes of a fondness for dirt and bad air. But let us first ask, Are the landlords and tenants responsible for this? Are not rather they responsible who, having the means to build better houses for the laboring classes and having the knowledge of the unsanitary and vicious conditions of the present tenement-houses, stand aloof and content themselves with blaming the landlords — who, in building, but follow the examples already set, in default of better ones — and the tenants, who must take the only shelter they can find? The laboring classes of New York must live somewhere, and perhaps even tenement-house landlords have been made the scapegoats for the omissions of those who knew better how to build and did not build. It is time to recognize that if the intelligent and wealthy portion of the community do not provide homes for the working classes, the want will be continually supplied by the less intelligent class and after the old fashion. Those who are unwilling to lend their aid to the needed reform forfeit all right to make charges of selfishness against those who build what pays them best and the best they know how to build.

Too much time has already been wasted in discussing what is "the best way to redeem New York from its tenement-house curse." One thinks legislation is to be the means of salvation; another, personal influence upon the tenants; another, the erection of new buildings; while all these are good and all necessary, each in its own field. There is no clash between these various methods, and while the question is under debate the number of old style unsanitary houses increases year by year. Let the lawyers and sanitarians reform the laws, let capitalists build improved dwellings, and let those who are none of these give time and influence among the existing tenement-house population, and the solution of the problem is near at hand.

Legislation may accomplish much, but let us guard against so easy an excuse for inaction. It is useless to legislate present houses out of existence, if better ones are not forthcoming. Let some better houses be built first, and less legislation will be necessary to improve existing unhealthy buildings and the many foul old rookeries and underground dwellings; for, of one hundred thousand families in present tenement-houses, it is safe to say that three fourths will move gladly into better accommodations, so soon

as these are provided, and would do so to-day if they had the chance. If even a few such blocks were built, the leaven would speedily leaven the whole lump of old fever nests, and landlords would hasten to copy the improvements ere their houses should lose their tenants.

No law can be enforced so rigidly as the law of supply and demand. There is no official mandate so powerful as self-interest, and no court so omnipotent as competition.

CORRESPONDENCE.

THE COURANT BUILDING. — NEW WORK. — THE CAPITOL.

HARTFORD, CONN.

AFTER a Micawber-like season of waiting, several architectural projects of moment have at last "turned up." A sharp competition for the new offices of the *Daily Courant* has taken place, and resulted in favor of Mr. Keller, of Hartford. The block will be built, as mentioned in a former letter, upon State Street, opposite the new post-office. It will be five stories in height, and will measure 48 feet by 116 feet. Midway upon the front is the main entrance, which is marked by a porch decorated with polished columns of granite. A bust of General Hawley, the editor-in-chief, is to be placed above the doorway. Flanking the main approach, on the ground floor, are stores or banking houses with iron fronts. The building above this level is of brick, with a finish of Ohio-stone. The façade has no projections, but a relief to the treatment is obtained by the introduction of ornamental brick in broad diaper bands. The walls of the first and second stories are pierced principally by square-headed windows grouped together, while the upper windows are disposed in arcades, and variety is also given by a special treatment of the windows on each story centred over the main entrance. The roof is flat, and the cornice is of brick and stone. A counting-room for the *Courant* is planned upon the first floor, and is connected with the press-room in the rear of the block at the ground level. A fire-proof room is provided for the proper preservation of the valuable files of the paper. The editorial rooms occupy the fifth floor. The composing rooms are on this floor, in the rear. The work upon the new structure will soon be commenced.

A carefully designed street front is soon to make its appearance upon Asylum Street, opposite the Allyn House. The block is to be built by Mr. Francis Goodwin, from plans by Mr. Kimball. It will measure 24 by 60 feet, and will be four stories in height. The design is pervaded by the "Queen Anne" feeling, and will form a pleasing contrast to the average public building in the city. The lower story will be of pressed brick, light stone, and granite. A large shop-window with elliptical arch is a conspicuous feature of the design on the ground floor, and on either side are entrance doors, with similar arches, one door leading to the shop and the other to the public hall-way. The arches will be of moulded brick with label-mould of stone. A boldly projecting bay-window of generous proportions carried out on carved stone corbels marks the first story, flanked on either side by narrow single windows with ornamental caps. The walls in the story above are pierced by narrow windows having stone transoms, and breaking through the cornice is a lofty dome of brick and stone, displaying diaper and moulded brick in various patterns. The roof has a high pitch and will be crowned with terra-cotta ridge-cresting. The lights in the various windows, will, in part, show small panes in studied patterns, while the shop-window on the ground floor will have a light iron frame above its transom, effectively divided. The façade will be enriched by carving, notably by a panelled stone band below the first story, and the foliated caps of the piers beneath the arched work. The interior of the block is designed for a shop on the ground floor, occupying the entire depth, and offices above. The work will be in the hands of contractors during the present season.

Mr. S. W. Lincoln is engaged upon plans for a block of stores, an opera-house occupying the upper floors. The block measures 63 by 77 feet. It will be built of pressed brick with finish of light stone, the first story having an iron front displaying considerable detail work. Above the stores on the first floor are offices, and from this floor access is had to the opera-house by means of wide staircases. The theatre has seating capacity for about one thousand people, and has the requisite exits, fire-escapes, etc. It is planned with parquette, parquette circle, and balcony. The ceiling will be enriched with panelled work, and the stage will be conveniently arranged with all the modern adjuncts and every requisite for proper reproduction of the drama. The building, which will be begun during the early part of June, will be located in the town of Rockville, Conn.

Mr. Brocklesby has in hand plans for a secret society building for one of the fraternities connected with Trinity College. The structure will be built near the College, and will be of Portland stone, laid with rock face, and relieved by dressed light stone. In plan and design it will be in strong contrast to secret society buildings throughout the country.

During the past week Capitol matters have been looking up. The twelve statues have now been put in place around the dome, and the public are indebted to the commissioners for twin representatives of Science, Law, Agriculture, Commerce, Industry, and Art, though it is doubtful if, at the giddy height at which these marble effigies are poised, the average legislator can determine which is which. The statues cost some twelve hundred dollars apiece ; they are twelve feet in height, and weigh about a ton each. They were cut at the New England Granite Works in this city, from the models of Mr. J. Q. A. Ward, of New York. The height at which the statues are placed does away with much of the expression which is clearly observed on nearer inspection, and individuality is chiefly obtained by outline and pose of figure. The general criticism is that the statues are too small, and partake somewhat of caricature rather than impart added dignity to the conspicuous feature of the general design. The irreverent newspaper goes one step farther, and adds in grim satire, of the figure of Science, that it is "fully draped with one hand held to the forehead, pensively — or expensively — pondering the question of the dome piers."

The second of the medallion heads, which form the best portion of the mural docoration of the building, has just been finished. It is a likeness of Noah Webster, the distinguished lexicographer, who was born at Hartford, in 1758. The medallion is on the east façade, and forms the counterpart to the head of Dr. Horace Bushnell.

A question of some moment has of late been raised touching the grading of Trinity Street, which bounds the Capitol grounds on the east. By a most unfortunate error on the part of the authorities, the building was placed too low. As it is impossible to raise the Capitol, the only alternative is to lower the hill on which it rests, or more properly in which it is sunk. The Capitol commissioners (in whose hands the Legislature placed $25,000 for grading the grounds) and the commissioners of the park adjoining the Capitol would have the city fathers meet them part way in the dilemma, and raise the grade of the boundary street. The city fathers, however, not desiring to "father" the mistake of the Capitol commissioners, a mistake long ago foreseen, think the city money can be better expended. For this bit of economy they are dubbed fools, "ignoramuses," etc., and have other compliments hurled at them by the local press, all of which may be very politic, but certainly not conducive to the attainment of the end immediately in view. At present writing the grade of the street has not been changed. CHETWOOD.

QUEEN ANNE.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — The comparatively recent revival, in England, of what is commonly known as "Queen Anne" work, is suggestive of one or two reflections. Since its first advent down to the present time, it has given us nothing more valuable than a slavish reproduction of certain features characteristic of the "Queen Anne" period, combined in an odd, old-fashioned way, aiming at nothing higher than picturesqueness ; and on this side of the Atlantic, we have caught a little of the same influence. Its course has been from the earlier types down to the later, bordering on the times of Chambers. What at one time would be looked upon as debased classic work is now old enough to be reproduced. Probably, if the fashion continues, we shall all see the first attempts of the Gothic revivalists copied in all their crudity.

It is true that in some of the old work there may be more delicacy of detail and other qualities worth reëmbodying, but there is no need to copy old features merely because they are odd, to strain after picturesqueness by placing, for instance, windows and fireplaces in most unsuitable positions. A style such as this cannot long survive, for if architectural design is based on any principles, this seems to recognize none, and therefore will not satisfy the aspirations toward a higher art: and the present style is only interesting so far as it suggests to what it may lead.

The "Queen Anne" revival was the reaction from the attempt to carry out domestic architecture on a mediæval model. That attempt was a failure. It seems strange, at this time, to read some of the earlier lectures on architecture by Mr. Ruskin, in which he so strenuously speaks on behalf of Gothic architecture. Greek ornament had little charm for him then, though many years afterwards, in *Fors Clavigera*, he explained how significant an ornament the Greek fret was, which formerly he looked upon as unmeaning. To him the Doge's palace was as fine a work as the Parthenon, an opinion which Mr. Ferguson, in his History of Architecture, did not favor.

The first revival of classic art in England was coeval with the revival of classic literature, and if the next change of style in architecture is to have a relation to the dominant thought in modern literature, we may expect to see it tend towards classic art again, but probably adopting more of its spirit than its form. It is only reasonable, seeing there is so much that is of classic derivation in the detail of the reigning style, that in course of time we should be no longer content with debased models, but draw our inspirations from the original source. Not only in detail, but in the proportion of the different parts, do we need to strive toward a higher result, training the eye to be sensitive to higher harmonies of forms. Mr. Alma Tadema, we are told, "attaches great importance to the shape and size of his canvas; and the realization of size and space, air and light, for which he is justly famous, is brought about by a careful consideration of proportion and an accurate knowledge of the value of detail." "He is constantly lengthening out or cutting down his pictures."

If proportion is valued so much by a painter, how much more attention ought it not to receive from an architect, whose works are for the public eye at all times? For the study of form and proportion, we may safely affirm, there is nothing better than Greek art. The æsthetic sense in the Greeks attained a development which has never been equalled; there was a subtlety in the forms they used, a simplicity in their outlines, a grace and refinement in their ornament, the spirit of which is not found in modern work.

With the appliances we have in our times for copying and reproducing, we need be under no difficulty in studying the remains of ancient art. In these respects we have innumerable advantages that the first revivalists of classic art had not. And our aim ought to be, to rest satisfied with nothing that we perceive falls short of our highest conceptions. R. B.

THE INTER-OCEANIC CANAL.

WASHINGTON, D. C., June 18, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT :

Dear Sir, — Your last issue, of June 14, 1879, contains an article by E. W. Bowditch, in regard to the "inter-oceanic canal." Mr. Bowditch's views on the subject are quite correct. There exist in the libraries of the world not sufficient material to even approximately determine the route of a ship canal over the isthmus. All the plans so far submitted are more or less speculations, based on loose investigations, which hardly deserve even the name of good reconnoissances. The wretched maps accompanying the different plans and reports make any comparison as to the value of the different proposed routes impossible, and are in themselves proof that their merits, being nowhere based on visible data, obtained by actual surveys, depend entirely and solely on the assertions of the respective projectors.

It would be sheer madness to plan and execute such a stupendous work as the construction of the inter-oceanic canal over the isthmus, the cost being estimated at from one hundred to one hundred and thirty millions of dollars, but which may well cost two hundred millions ere finished ; to start such a gigantic work on such meagre information, or rather no information at all of the topography of the interior of the isthmus, which as yet is a *terra incognita*, can only enter the heads of Frenchmen.

Mr. Bowditch is perfectly right, in that only a thorough instrumental survey, through the whole isthmus, can furnish the necessary material to compare the different proposed routes, and determine finally on that offering the most advantages.

Permit me here to state that General N. Michler, of the United States Engineers, as far back as June, 1870, not only proposed to the United States Engineer Department, for the purpose of finally settling this vexed question, *a survey over the whole isthmus along the watersheds, to be connected with all desirable points on the coast-line*, but at the same time submitted a *full plan of organization and estimates of cost* for the execution of this important work.

It is to be hoped that, stirred up by the somewhat forward action of the Paris congress, the proper authorities may take steps that this so important question shall be finally decided by those who are most interested in it, and therefore first called upon to decide it, — by Americans. T. E. W.

ANOTHER WESTERN COMPETITION.

CHICAGO, ILL., June, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT :

Sir, — Thinking that you might be interested by another example of the mode in which competitions are invited in the West, I inclose a "notice to architects," which, for the amount of work required, the time given to do it in, and the remuneration offered, would appear to be more of an appeal to the charity of the architectural profession than an advertisement to business men. If the Commonwealth of Missouri has to appeal to charity in this way, it does not seem fair that one profession should be thus singled out to furnish material for her public works. Why not have appealed to the builders and those having what is required to complete such a building as is desired? — asking them to put up as many such as they might choose, but requiring that each building should have such size, finish, and furniture as to make it cost considerably more than could be paid for it. When completed, these buildings to be inspected, and perhaps one of them accepted, and paid for at less than cost.

If this notice[1] is a purely business advertisement, why should men who have sufficient confidence and knowledge to fix the quantity and price for one kind of work not still further earn the gratitude of their fellow citizens by doing the same in all the other branches required about the building? No estimates would thus be required, and saving (?) would be accomplished in every way.

Yours, respectfully, H. S. J.

SCHOOL-HOUSE VENTILATION.

TO THE EDITORS OF THE AMERICAN ARCHITECT :

Gentlemen, — I have read with great interest the articles in your paper on the best plan of tenement-houses. I think it is one of the most important sanitary questions for large cities, for in these houses we have the largest mortality, and they are the breeding places for all kinds of infectious diseases, and so endanger the health and life of all the inhabitants, even of those who keep their own dwellings in the most perfect sanitary condition. By proper arrangements of the rooms, privies, stairs, etc., no doubt a great deal can be done to better the sanitary condition of these houses, but the main thing, it seems to me, is an effective ventilation, and just in this respect all the plans for tenement-houses which I have seen are deficient, — their ventilation is insufficient. In tenement-houses there will always be more or less filth. The habits and character of the classes who live in them will make this unavoidable. This filth must be destroyed and this will be done in the best way by a constant and sufficient current of fresh air through every part of the building. That such a ventilation has its great practical difficulties I am well aware, but by a slight modification of a plan of forced ventilation for school-houses, which I have described in the enclosed paper,[1] I think they can be overcome. This plan would be cheap, it would insure a constant current of fresh air through every part of the building under all conditions of the weather, and this current would go on in spite of all carelessness of the inmates, who would rather be inclined to promote it, as it would bring them warmth in winter and coolness in summer.

This plan will be less applicable to small tenement-houses, on account of the expenses it causes, but, in any case, sanitary measures can be carried out effectively, without reducing the profit of the building, only in large tenement-houses for four hundred or more people. Such large houses will bear very well the expense of keeping a superintendent, who can attend to the ventilating machinery and all other sanitary measures. To make up, if necessary, for the wages of the superintendent and the cost of the ventilation, the house might be somewhat more crowded, or the ceilings made lower without any harm, provided every person gets his proper amount of fresh air.

Your opinion about this plan would be valuable to me, as well as to several gentlemen of this city connected with the public affairs.

Very respectfully, DR. H. T. LEGLER.

THE EDDYSTONE LIGHT-HOUSE.

IN the English Channel, fourteen miles south-southwest of the port of Plymouth, and twelve and a half from Rame Head, stand the Eddystone Rocks, a cluster of twenty-three gneiss rocks about 650 feet long from north to south, spurs and detached reefs covering about the same distance from east to west. They are almost in the line which joins the Start and Lizard points, and in the fair-way of all vessels coasting the southern shore of England. So exposed are they to the ocean swell from all the south and west, that even in comparatively calm weather the waves go raging and thundering over their ledges, and their name indicates the incessant swirl of the deep about them. Excursion steamers run there often during the summer, but rarely land their passengers. On these rocks three light-houses have been built in the last hundred and eighty years, since Europe became civilized enough to make such works practicable. Henry Winstanley, a retired London mercer, was the architect of the first, which was begun in 1696 and completed in 1699. He had such a taste for mechanics — for the bizarre in mechanics, that is — as Robert Houdin displayed so ingeniously in his villa near Paris, to the consternation of all his acquaintances, and amused his leisure at Littlebury, where he lived, by constructing chairs which folded their arms round those who sat down on them and held them prisoners, though less cruelly than the maiden statue filled with knives at Baden, and by arranging an innocent slipper in the middle of a room, which, when the unwary visitor paid it the passing tribute of a kick, caused a frightful ghost to start up from the floor. The idea of his light-house was suggested to him by a picture of a Chinese pagoda, and he built it of wood, in a polygonal shape, about a hundred feet high, and set it upon a polygonal stone base twelve feet high and twenty-four feet in diameter. Its form of course rendered it peculiarly liable to be swept away by the waves, while its huge gables, vanes, cranes, and wooden candlesticks exposed it to the action of the wind. It was gaudily ornamented with painted and gilded suns and compasses and mottoes, such as "Post Tenebras Lux," "Pax in Bello," and "Glory be to God," and to protect its occupants against the attacks of foreign enemies, Frenchmen, Dutchmen, Spaniards or Turks, there was a platform from which, by means of a movable shoot, masses of rock could be hurled upon assailants. There was a kitchen, accommodation for the keepers, a state parlor carved and painted, with a chimney, two closets, and two windows giving upon a spacious balcony, and a splendid bedchamber richly gilded and painted. Winstanley is represented in an engraving of this light-house (which was virtually a huge cockney summer-house set on stilts) as fishing out of the parlor window. Engineers and scientic men even then knew that he was mad, and warned him that the structure was a card-house, but to no effect. He insisted on spending a portion of his time in it as a point of honor, and declared his anxiety to "be in it during the greatest storm that ever blew under the face of heaven." His wish was gratified. He had visited it in November, 1703, to superintend some repairs, when what is remembered still as the "Great Storm" burst over the English coasts, the ever-memorable tempest which destroyed many of Sir Cloudesley Shovel's vessels then in the Downs, unroofed half of London, and inspired Mr. Addison, then "distressed by indigence," to compare the Duke of Marlborough, at Blenheim, with the angel riding in the whirlwind and directing the storm, a simile which earned for its author the Commissionership of Appeals. When the sun rose on the 27th of November there was no vestige of the pagoda to be seen, and with it Winstanley and his five men had been swept away.

In 1706 the erection of the second light-house was begun at the expense of another London silk mercer, Mr. John Rudyerd. It was completed in 1709, and was a very creditable piece of engineering. In form it was the frustum of a circular cone. For twenty-seven feet

[1] The notice referred to is the invitation to furnish plans, specifications, and estimates for rebuilding the Missouri State Lunatic Asylum No. 2, near St. Joseph, Mo. — EDS.

[1] This plan will be described in a following number.

it was nearly solid, the filling consisting of courses of cut-stone alternating with courses of squared timber, the outside casing being of seventy-two oak posts fastened into the rock by heavy irons let into lewis holes, this being the first recorded application of the lewis for this use. The tower stood till the night of December 3, 1755, when it caught fire in the lantern and was destroyed. The keepers had to retreat from room to room as the fire gained till they reached the rock. For a wonder the weather was calm enough to admit of a boat landing in the morning and taking them off. Mr. John Smeaton was selected to build the third light-house, the type of all structures of the kind that have since been erected. His studies of wave action convinced him that no building can stand the continuous shock of wave after wave if the blocks are merely laid one upon the other as in ordinary masonry, so he set himself to make a tower which should be practically a monolithic prolongation of, and so be equally stable with, the rock beneath. He took stone for his material, and for the lines of his model measurements of the proportions of the trunks of the old oaks in Windsor Forest. The general form of the "deep-sea lamp-post" is "the frustum of a solid of revolution formed by revolving a vertical plane bounded on one side by a concave curve around a vertical axis." It was built of large blocks weighing from a ton to a couple of tons of the strongest Portland oölite, cased in granite, the expense of using nothing but granite being thought too great. The stones of each course were joined by dovetailing, and the courses were connected by stone dowels, and the upper surface of the rock was cut in horizontal steps, so that every course of masonry rests upon a horizontal bed. The combinations devised for obtaining the greatest strength by dovetailing, dowelling, cramping, and the use of hydraulic mortar have never been surpassed; indeed Smeaton's discovery has been called "a revolution in architecture as great as that effected by the use of the keystone in the arch, or the introduction of the iron girder in buildings of the Italian style." The diameter of the lower partial course of masonry is 32 feet, that of the lowest entire course 26 feet. To a height of 35 feet it is solid; the whole height of the masonry is 77 feet. Under the coping the course is 15 feet in diameter; the tower is surmounted by a parapet wall 6¾ feet high and 8¾ feet in internal diameter. There are four rooms, one above the other, and at the top a gallery and the lantern. The stone floors are flat above and concave below, and are kept from pressing against the sides of the building by a chain let into the walls. The light-house was begun on the 2d of April, 1757, and when it was finished, August 24, 1759, Smeaton said that nothing but an earthquake could destroy it.

And yet this splendid tower had one fatal fault — it was too strong! The waves have smitten it in vain — the keepers say that each blow sounds like a cannon-shot, and the light-house vibrates like the trunk of a wind-shaken tree as the waves actually overleap the lantern, and the only accident in its history was the burning of the wooden part of the structure in 1770. It stands on an irregularly shaped crag, the House Rock, the upper surface of which more or less overhangs its actual foundations, and the waves have gradually undermined this precipitous submarine wall; at the same time so solid is the light-house that it has played the part of a rigid crowbar thrust into the rock and violently worked to and fro, creating fissures in the foundation crag; it has been an immense lever, and sooner or later will break or pry off the rock and tumble with it into the waves. In 1839, and again in 1865, iron bands were introduced into the interior of the superior portion; part of the projecting crag was cut away to lessen the leverage of the water, and the cornice which Smeaton placed near the top, partly for ornament, partly to protect the lantern, was bevelled off, but all in vain, and the fine old monument of engineering skill was condemned. Twice already, indeed, on the 3d of February, 1869, and on the 9th of October, 1878, it has been reported as destroyed. The Elder Brethren of the Trinity Board have now prepared a light-ship, which can be moored close by, should the present structure tumble ere the new one is completed. — *Exchange.*

NOTES AND CLIPPINGS.

Improvements in Coating Mirrors. — The French Academy has awarded a prize of two thousand five hundred francs to M. Lenoir for improvements which secure to mirrors all the advantages of silvering, together with the qualities of amalgamation, under conditions which preserve workmen from exposure to mercurial vapor. The glass, after being silvered by means of tartaric acid and ammoniacal nitrate of silver, is exposed to the action of a weak solution of double cyanide of mercury and potassium; there is thus formed a white and brilliant silver amalgam which adheres strongly to the glass. The operation is facilitated, and all the materials are economized, by sprinkling the glass, at the moment when it is covered by the mercurial solution, with a very fine zinc powder, which precipitates the mercury and regulates the amalgamation. Mirrors which are thus prepared are free from the yellowish tint of ordinary silvered glass, and the amalgam is not easily affected by sulphurous emanations. The committee, in their report, also recount M. Lenoir's improvements in galvano-plastic processes, his discovery of an autographic telegraph, which reproduces writings or drawings with printer's ink, his new and ingenious methods for securing the synchronism of the transmitter and the receiver, and the well-merited reputation which he has acquired from his gas motor. — *Comptes Rendus.*

The Poikilographic Process. — Signor Lombardi has been exhibiting lately in London a process, styled the poikilographic process, by which oil paintings can be reproduced in fac-simile. Its results are said to be surprisingly satisfactory.

Hieroglyphics in Minnesota. — A despatch to the St. Paul *Pioneer Press* announces the discovery of a remarkable cave on the farm of David Samuels, ten miles from La Crosse. The cave is thirty feet long, thirteen feet wide, and about eight feet high. Above the quarry sand, which has evidently drifted in and covered the floor to the depth of three to six feet, upon the walls are very rude carvings representing men, animals, arms, and implements, and some appear to be hieroglyphics. One picture represents men, with bows and arrows, shooting animals, three buffaloes and one rabbit. Another represents three animals which, if large, must have been like the hippopotamus; another appears to represent a mastodon; in another picture a moose is quite plainly delineated. There are eight representations that are canoes, much curved, or hammocks, which they more resemble. One sketch of a man is very plain; the figure wears a kind of chaplet or crown, and was probably chief of his tribe. There are many fragments of pictures where the rock has decomposed. The rock is a coarse, soft white sandstone. On one side of the cave is a space about two feet high and two and a half in length, made into the wall. Above are the upper fragments of pictures, and below are lower fragments, showing that they were made when the rock was entire. From the depth to which decompositions reached in this dry and dark cavern, the inscriptions must be quite ancient. If the carving mentioned really represents the mastodon, the work must have been done by mound-builders. The accumulated sand needs to be removed to get a full view, and possibly human remains may be found. The entrance to the cave had evidently been covered by a land-slide, there being left open only a small hole, where traps have long been set for coons. The large number of these animals that were caught led to the belief that the space inhabited by them must be large, and investigation led to the discovery of the cave. Over the entrance, since the land-slide, a poplar tree eighteen inches in diameter has grown, which shows conclusively that the cave has not been occupied by human beings for more than a century.

Lightning Conductors. — In some recent accounts of damage done to the church of Laughton-en-le-Morthen, it was stated to be protected by a lightning conductor. From the description of the damage done to the building, Mr. R. S. Newall came to the conclusion that there was no efficient conductor, so he had it examined, and the following is the result: The spire is one hundred and seventy-five feet in height, and it had attached to it a thin tube, made of corrugated copper, about seven eighths of an inch in external diameter and five eighths internal. The copper is about one thirty-second of an inch in thickness, and it weighs about one and one quarter pound per yard. It is made in short lengths, joined together by screws and coupling pieces, but there is no metallic contact whatever between the pieces, which are much corroded. The conductor appeared to be fastened to the vane. It was not in contact with the building, which it ought to have been, but it was kept at a distance of about two and a half inches from it by twenty-one insulators. The earth contact was obtained by bending the tube and burying it in the ground at a depth of from six inches to eighteen inches, the soil being dry loose rubbish; the length of the earth end was only three feet, with two short pieces of about a foot in length, each tied to the tube by thin wires, thus forming altogether a most inefficient conductor. It was placed in a corner formed by a double stone buttress, which came between the conductor and a lead-covered roof attached to the spire, the distance between the conductor and the lead roof being about six feet six inches. The lightning appears to have come down the conductor a certain distance, and finding the road to earth bad, it passed through a buttress, dislodging about two cart-loads of stone, and then came down the cast-iron down pipes, leading from the lead-covered roof, and so to earth. Now if the conductor had been made of copper-wire rope, weighing about two pounds per yard, and fixed in contact with the spire, without insulators and with a proper earth contact, no damage whatever would have been sustained by the building; and if the conductor had been tested periodically by an expert, he would have shown whether the conductor was good or useless. This examination ought to be insisted on, as the earth connection is often wilfully destroyed; but Mr. Newall states he has never in all his experience known a building which had a conductor properly fixed to suffer damage from lightning. — *Building News.*

New England Cotton Mills. — It is argued that before long the cotton mills of New England will be built with one story, instead of with five or six, as at present. The advantages claimed are increased safety and convenience, and a higher speed of machinery. The report of a New England gingham factory on last winter's use of a new one-story building was that it covered about an acre, was built of brick with corner towers, at a cost of $23,000, and saved in gas alone a sum equal to the interest on the cost of the building. The looms were driven at twelve per cent higher speed than on the second floor of the old mill, the repairs were fewer, and less imperfect work was turned out.

Speculative Building. — Speculative builders are at the present moment in much tribulation. They have glutted the market with their flimsy structures, which cannot find occupants, and stand empty in long melancholy rows like traps, waiting for birds that will not be snared. Some observations made by Sheriff Spens at Glasgow on Wednesday, with reference to a petition for "cessie" at the instance of a builder in that city, show how little commiseration their misfortunes excite in legal bosoms. In refusing the petition the sheriff remarked with stern simplicity: "This case is that of a young man of twenty-five, who, according to his own account, with a few pounds of capital, indulged in building speculations to an extent involving some £12,000 at least. It is this speculative building, which has gone on in Glasgow during the last few years, that is to some extent responsible for the great depression of trade in the city. It may be, and probably is, the case that there are others equally if not more blamable than the builders themselves in connection with these building speculations; but it is out of the question to hold that such speculative builders, when the result of their speculation turns out unfortunately, are the victims of innocent misfortune. It is really reckless trading in stone and lime." This at least cannot be said of the speculative builders in London and its suburbs. They have traded recklessly, not in "stone and lime," but in road-sweepings and other rubbish of a still more objectionable description. — *Pall Mall Gazette.*